Prehistoric Settlement and Networks of Interaction in the Western Solomon Islands: A Survey of Manning Strait

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Cover Photo: Aerial photograph of Manning Strait, facing east with half of Wagina in shot and the Arnavon Islands and northwest Santa Isabel faintly visible in the distance. Taken by the author in January 2019 following the completion of the doctoral field research.

Abstract

This thesis is an investigation into the prehistory of the western Solomon Islands and an examination of archaeological sites located in and around a deep-sea passage between Choiseul and Santa Isabel known as Manning Strait. Archaeological surveying has been carried out in this part of Solomon Islands since the 1960s, however, Choiseul, Manning Strait and large parts of Santa Isabel have received little attention. An important aim of this study was to address this and, ultimately, contribute towards constructing a more complete and comprehensive archaeological sequence for Solomon Islands.

Three fundamental aspects of the culture history of the western Solomon Islands are examined. The first is the prehistoric settlement of the region during the late Lapita period (ca. 2700-2000 BP) and evidence of how mobility patterns changed over time. The second is the development of prehistoric trade and exchange networks from initial settlement leading into late prehistory. This period, specifically the last millennium, was a pivotal time in western Solomon Islands which saw major cultural developments such as the emergence of head-hunting, monumental architecture, specialised production and exchanging of shell valuables and increasing contact with Europeans. The third is processes by which cultures in the region changed and diversified over the last two and a half millennia. This traditional culture historical approach is partnered with theoretical outlooks that have developed in more recent years in island archaeology whereby islands are perceived not as singular entities but as part of a broader 'sea of islands' or 'seascapes'. Manning Strait is perceived in this manner not simply as a setting but as an active agent in influencing the course of cultural transformation in the western Solomon Islands.

The methodological approach taken in this study draws upon archaeological survey and excavation, laboratory analysis of ceramics, lithics, shell artefacts and faunal remains, and a systematic review of ethnographic and historical literature. Significant outcomes of the fieldwork that are presented include the discovery of a 2.5 m deep cave deposit on Wagina, southeast Choiseul, dating to 2300-2150 calBP, a late Lapita intertidal site in northwest Santa Isabel, and ceramic deposits on the Arnavon Islands and Laena Island dating to between 850-150 calBP. A wide range of artefacts are analysed in this study, although emphasis is placed on exploring production and distribution patterns of pottery to gain insight into the development of both local and regional patterns of inter-island interaction. At the end of the thesis, a ceramic sequence is put forward for Choiseul as well as a revised cultural sequence for the wider western Solomon Islands that builds upon earlier archaeological modelling and findings. Additionally, the dynamic role Manning Strait played in prehistory as an ocean highway in the late Lapita period and altering to becoming a highly contested seascape in late prehistory is discussed.

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Chapter 1 Introduction

This study is an inquiry into the prehistory of the western Solomon Islands and an examination of archaeological sites located in and around a deep-sea passage between Choiseul and Santa Isabel known as Manning Strait (Figure 1.1). It explores three fundamental aspects of the culture history of the region. The first is the arrival of people to the western Solomon Islands and evidence of their settlement and mobility patterns. The second is the development of prehistoric trade and exchange networks. The third is processes by which cultures in the region changed and diversified over time. These factors are examined within a theoretical framework that draws primarily upon culture historical models, and biogeographical and archaeological studies of islands. It is argued in this study that having a holistic recognition of the nature and various scales under which interaction may have occurred in the past, as well as what barriers may have existed, is crucial to reconstructing processes of culture change in Oceania. This is particularly the case in 'seascapes', such as Manning Strait, where high levels of inter-island interaction and mobility have often been portrayed as an underpinning characteristic of maritime societies who occupied such environments in prehistory (e.g. Irwin 1992; Erlandson & Fitzpatrick 2006).

As natural water barriers to the movement of most plant species and terrestrial animals, straits have been demonstrated to be intriguing environments to study and model biological diversity. This was demonstrated, perhaps most famously, by natural historian Alfred Russel Wallace. During his visit to the Malay Archipelago in the late 1850s, Wallace's reflection on marked zoological differences seen across Lombok Strait in Indonesia led him to propose that a biogeographical boundary existed between, and separated, the ecozones of Asia and Australia (Camerini 1993). This boundary, known as the Wallace Line, remains one of the most significant biogeographic markers in the western Pacific. It holds significance for the distribution and evolution of plant and animals as well as the modelling of Hominin migrations out of Africa and their dispersal into the Asia-Pacific region.

The same qualities that make straits attractive environments for the scientific study of floral and faunal biodiversity and genetic evolution can also be of value to anthropological study of cultural diversity and human mobility. In one sense, straits can divide and isolate communities by acting as a water barrier. At the same time, straits can also facilitate inter-island interaction by providing a sea bridge, usually less volatile than open ocean, for the movement of people and exchange items. This dynamic balance between physical and sociocultural barrier and bridge is examined here through the lens of an archaeological study of Manning Strait.

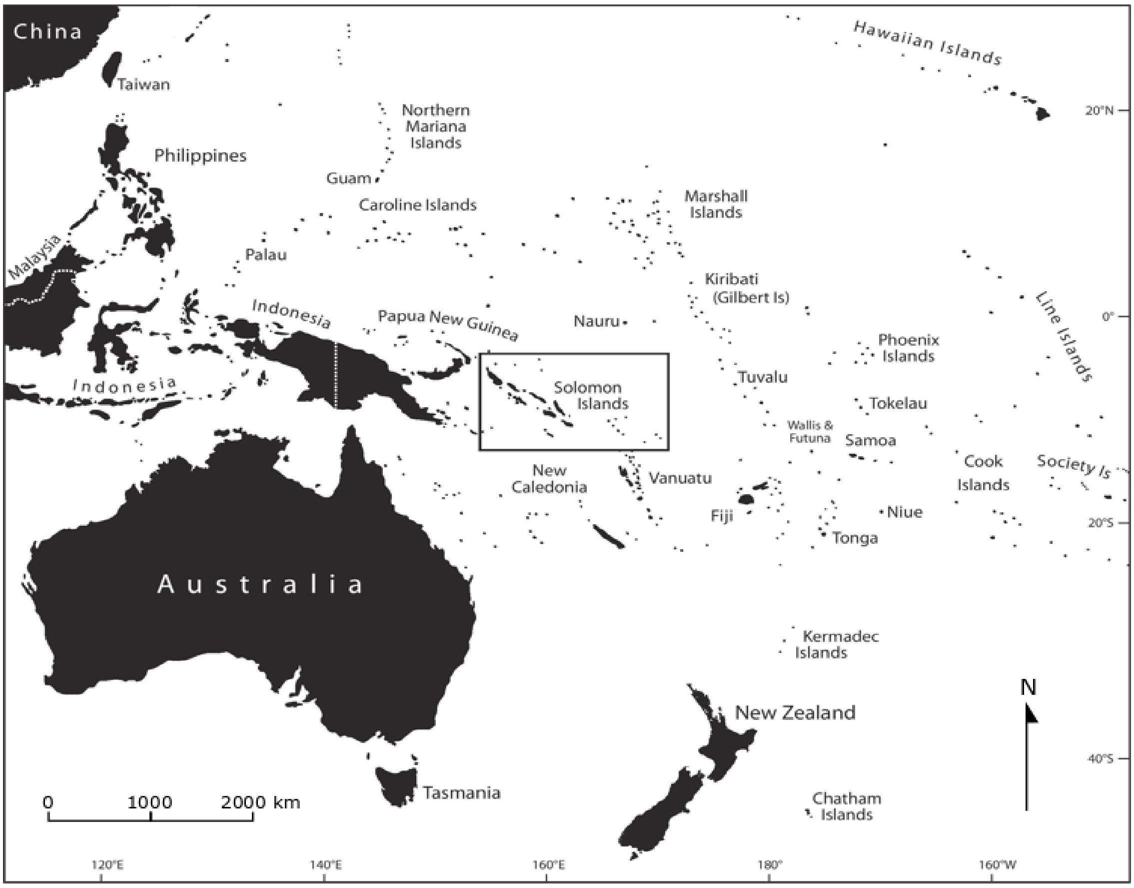


Figure 1.1 Map of western Pacific showing location of Solomon Islands.

The western Solomon Islands, which will hereby be referred to as the Western Solomons, encompasses three of the nine major provinces of the country (Figure 1.2). These include Santa Isabel, Choiseul and the Western Province. Santa Isabel will hereafter be shortened to Isabel and the Western Province will be referred to as the New Georgia group. Archaeological research began in the Western Solomons in the 1960s (Chikamori 1965; Miller 1979), and it has grown tremendously in the last two decades following the initiation of the New Georgia Archaeological Survey (NGAS) in 1996 (Sheppard and Walter 2006). The NGAS was pioneered to establish a baseline archaeological sequence for the region and was directed towards the study of the historical development of indigenous societies. This included, in particular, the emergence of the Roviana Chiefdom and associated head-hunting complexes and ancestor cults in the last several centuries (Sheppard *et al*. 2000; Sheppard *et al*. 2004;

Walter *et al*. 2004). The project also facilitated the development of a number of student research programmes which have made lasting contributions to the archaeological record of the region. They have resulted in, for example, the creation of the first and one of the most comprehensive ceramic sequences for the main Solomon Islands chain (Felgate 2003). In addition, we now have a far better record and understanding of shrines and other prehistoric monumental structures (Nagaoka 1999; McKenzie 2007; Hurford 2017), social and ritual landscapes (Nagaoka 2011), and traditional exchange systems that existed there in the past (Thomas 2003; Buhring 2011; Buhring *et al*. 2014). More recently, independent research programs carried out in the New Georgia group by some of these former students (Felgate 2007; Thomas 2009) and other archaeologists (Summerhayes and Scales 2005; Tochilin *et al*. 2012) have continued to improve our knowledge about Western Solomons' prehistory.

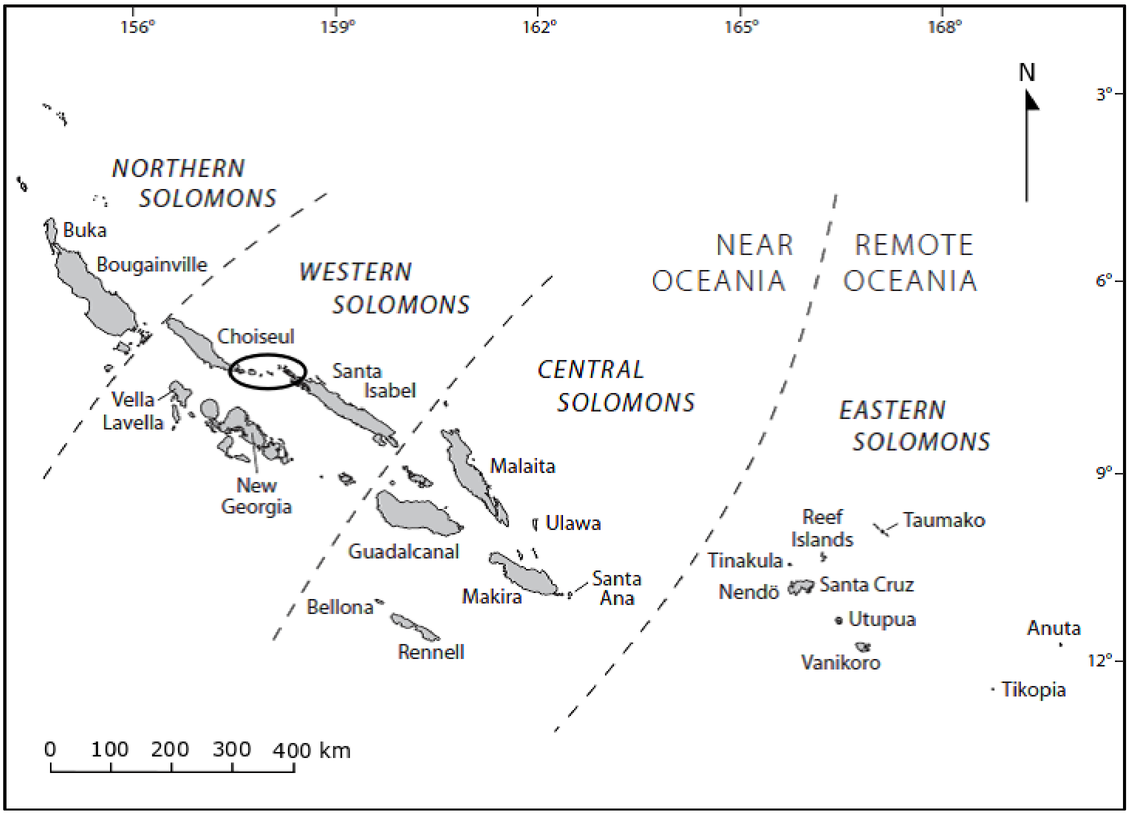


Figure 1.2 Map of Solomon Islands showing major island regions and location of Manning Strait (circled).

Choiseul, Isabel and the islands scattered between these two provinces in Manning Strait have received little attention in advancements in the archaeological study of the Western Solomons. This has resulted in an uneven geographic spread of data collected from the archaeological record. In Choiseul, for instance, no radiocarbon dating has been carried out and less than a hand-full of archaeologists have surveyed the region

(Itoh and Chikamori 1967; Miller 1979). Isabel has received more comprehensive investigations in the last decade (Roe *et al*. 2007; Carter *et al*. 2012). This has resulted, however, in only a partial reconstruction of the prehistoric settlement of the province. My research, which began in 2016 in conjunction with one of my supervisors, Professor Richard Walter, and his survey project on the Arnavon Islands (Walter and Brooks 2014), sought to address this gap in the archaeological coverage of the Western Solomons.

This chapter lays a foundation for the research discussed in the remainder of the thesis and is structured in two segments. The first describes three important cultural phases of the prehistory of Solomon Islands: the Late Pleistocene to mid-Holocene, the Lapita period and the last two millennia which will be referred to as the post-Lapita period. Key theoretical issues relevant to each phase that have been raised in previous archaeological research in Near Oceania are addressed in this segment. The second segment is an explanation of the research design which consists of three primary research aims and three sets of corresponding research questions. Field objectives and an overview of the methodological approaches taken in this study are also given. Finally, at the end of the chapter an overview of the content of the thesis is provided.

1.1 Solomon Islands Prehistory and Theoretical Issues

Solomon Islands has been described in the past as one of the least well understood regions in the Pacific (Kirch 2000: 131). Emphasis has been placed particularly on a lack of published literature (Kirch 1997, 2000; Spriggs 1997, 2000) and deficient archaeological sampling that seems to be most apparent in the main Solomon Islands (Spriggs *et al.* 2010; see comments by Thomas, Bedford and Kirch in Sheppard 2011). At the time these issues were first raised, the bulk of Solomons research had been concentrated at its northern end (Specht 1969; Irwin 1972; Terrell 1976; Wickler 1995), and at the far eastern Reef and Santa Cruz Islands (Green 1976; Yen 1982). In addition, the first intensive and published archaeological research projects in the main Solomons - David Roe's doctoral study on Guadalcanal (Roe 1993) and the NGAS - had only recently been completed.

Over the last twenty years, the situation has changed quite considerably. Tremendous improvements have been made towards addressing the paucity of publications and investigations in the main Solomons following the fruition of the NGAS and due to continually expanding collaborations between university researchers and Solomon

Islands National Museum (SINM) (e.g. Kelloway *et al*. 2013; Blake, *et al.* 2015; Sheppard *et al*. 2015; Kelloway *et al*. 2016; Hurford 2017; Kinaston and Buckley 2017; Haas *et al*. 2018; Bayliss-Smith *et al*. 2019; Oertle and Szabó 2019). Significantly, some of the poorest recorded regions in the main Solomons such as Malaita (Moser 2012, 2018) and Isabel (Carter *et al*. 2012) have been actively targeted. In contrast to some of the first archaeological accounts detailing Solomon Islands' prehistory (Green 1977; Reeve 1989), it is clear a far more comprehensive and synthesised body of knowledge is continuing to take shape (Walter and Sheppard 2017).

Archaeological research in Solomon Islands is maturing quite rapidly, and deservedly so as the region played a pivotal role in the prehistoric colonisation of the Pacific. Most notably, the archipelago is located at the precipice between the continental and predominantly inter-visible landmasses of the western Pacific and the vast open ocean that characterises the more sequestered islands of southern Island Melanesia and Polynesia. This boundary, labelled by Green (1991) as a division between "Near" and "Remote Oceania", is significant as it separates, to the west, one of the earliest inhabited island landscapes in human history and, to the east, the last major region on Earth to be settled other than Antarctica (Lilley 2008: 1632). In addition to its geographically focal location, Solomon Islands has been inhabited since at least the mid to late-Holocene and towards its far northern end, on Buka Island, as early as the Late Pleistocene. Archaeological, ethnographic and linguistic data have shown that its indigenous populations, in synchronisation with the rest of the Pacific region, were highly socially interactive (Walter and Sheppard 2017: 16). Over the millennia, Solomon Islands has become highly culturally and linguistically diverse and today is home to a wide assortment of ethnic and cultural groups and around 80 languages.

Addressing Solomon Islands prehistory as a whole is beyond the scope of this study. Rather, emphasis is placed on the Western Solomons and building upon our understanding about how cultures in the region transformed over time. It is argued here that despite considerable progress made in archaeological study of Solomon Islands, parts of the country such as Choiseul, Manning Strait and Isabel, have not received adequate attention. Due to a lack of field research carried out in these areas, reconstructions of Western Solomons prehistory have been dominated by the utilisation of, and a reliance on, the rich body of archaeological and ethnographic data amassed for the New Georgia region (Sheppard *et al*. 2000; Felgate 2003). For example, with the exception of some dating that has been carried out in northwest Isabel (Carter *et al*. 2012), the only comprehensive cultural sequences available for this part of Solomon Islands derive from research undertaken in the New Georgia group as well as in the Northern Solomons (Irwin 1972; Terrell 1976; Spriggs 1991) and on Guadalcanal (Roe 1993). The lack of archaeological research on Isabel and Choiseul has impeded our ability to acquire a more widely comparative understanding of prehistoric cultural processes that may be detectable in the archaeological record of the *entire* Western Solomons. Some of these processes, which are addressed in this study, include the prehistoric settlement of Choiseul and the Manning Strait region and the changing nature of the production and distribution of pottery, lithics and shell valuables in these areas.

In preparation for further discussion about these aspects of Western Solomons prehistory, this section provides a brief background to what is known and what is lacking in our understanding about the role Solomon Islands played in the shaping of Oceanic prehistory. It describes, firstly, the arrival of modern humans to the western Pacific and archaeological evidence of the earliest inhabitation of Solomon Islands. Secondly, it discusses the Lapita expansion and an important debate within this area of research regarding whether or not the main Solomons chain was settled during initial migrations into Remote Oceania. Lastly, it delves into the post-Lapita period of Pacific prehistory and assesses current understandings about prehistoric mobility and the development of networks of interaction in the Western Solomons.

1.1.1 Late Pleistocene to Mid-Holocene

Solomon Islands was the furthest east and one of the last major island regions in the western Pacific to be settled in the Late Pleistocene. During this period, sea levels fluctuated between around 60 to 120 m lower than they are today and most of the Northern Solomons was conjoined (Figure 1.3). This included Buka, Bougainville, Choiseul, Isabel, and Ngella which formed a large landmass named Greater Bougainville (see Neall and Trewick 2008: Fig. 2j). Guadalcanal was connected to Ngella by a narrow strait, whereas the New Georgia group, Malaita and Makira remained isolated. To the west, islands in the Bismarck Archipelago were larger than they are today due to the lower sea levels although most were still disconnected and still required overseas crossing to be accessed from the New Guinea mainland. At this time, the New Guinea mainland was joined to Australia and Tasmania and together formed a larger landmass known as a Sahul. Similarly, most of Island Southeast Asia, excluding the Philippines, formed a vast Asian sub-continent called Sunda. In between Sunda and Sahul was a water division, Wallacea, which required minimum water gap crossings of about 70 km (Allen and O'Connell 2008). This barrier was significant as it restricted other early hominin species such as *Homo erectus* west of Timor and Sulawesi for more than a million years, and its crossing represents a hallmark of the behavioural modernity of the first colonists into Sahul (Allen and O'Connell 2008: 32).

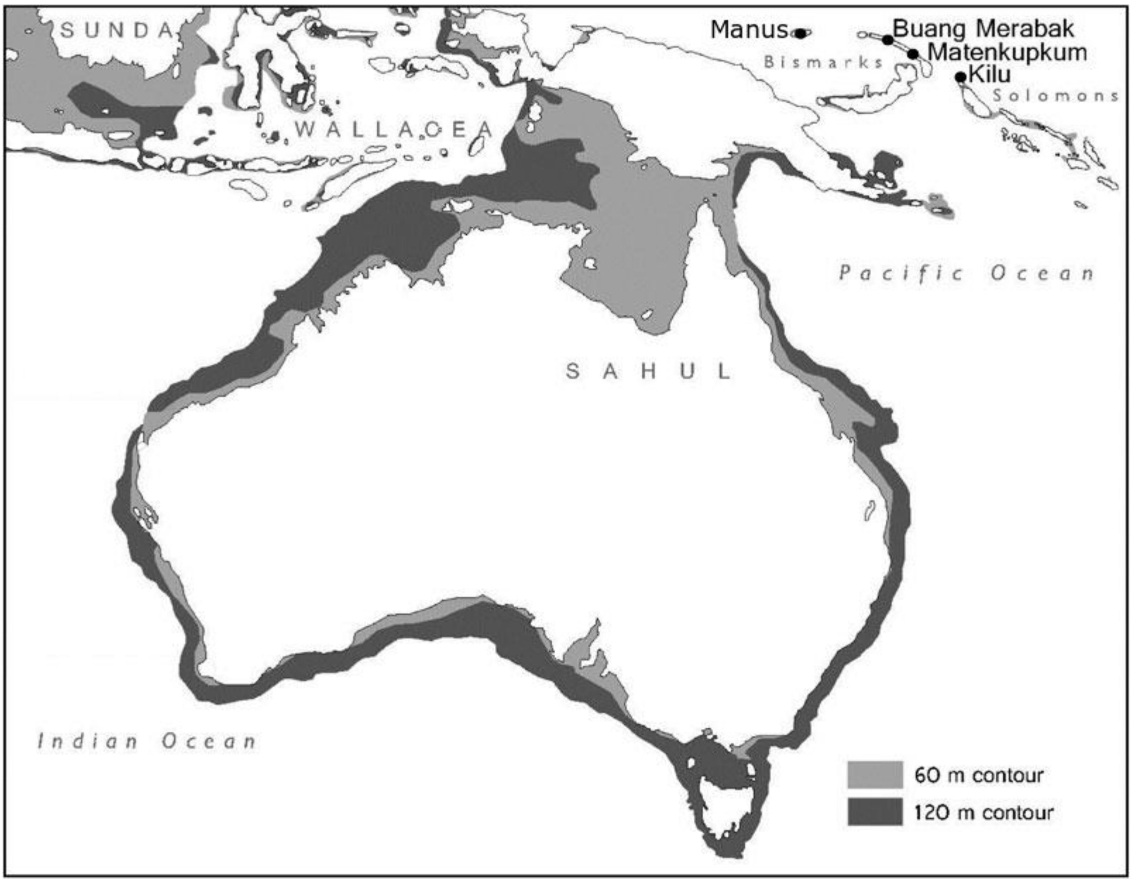


Figure 1.3 Map of Sahul and part of Sunda showing 60 and 120 m sea level contours, and location of Pleistocene sites mentioned in text. (Map adapted from Codding et al. 2014: Fig. 3).

To date, archaeological research has demonstrated an 'event horizon' that places the first crossing of the barrier and colonisation of Sahul near 50,000 years ago (Allen and O'Connell 2014, 2018; Bird *et al.* 2019).[1] The dating of cave sites, Buang Merabak (43.5 ± 0.9 kyr calBP) on New Britain (Leavesley *et al.* 2002), and Matenkupkum (40.7 ± 0.4 kyr calBP) on New Ireland (O'Connell *et al.* 2010) have demonstrated that the Bismarcks were settled soon after the first colonists crossed Wallacea. The more

[1] An isolated deviation from this is the Madjebebe rockshelter site located in Northern Australia which has been dated using optical stimulated luminescence to at least 60,000 BP (Clarkson *et al.* 2017).

remote island of Manus, which required a crossing of at least 180 km including 60 km out of sight of land, was reached later by approximately 15,000 BP (Fredericksen *et al.* 1993). The Feni Group and Green Islands located between New Ireland and the northern end of Greater Bougainville were occupied probably by at least c.4850 BP as shown from Lebang Takaroi cave on Nissan (Spriggs 1991: 237). These islands may not have been emergent during the Late Pleistocene, in which case the first colonists of Greater Bougainville would have travelled 130 km via Feni or 180 km directly from New Ireland.

The earliest and only recorded Late Pleistocene site in the Solomons archipelago is Kilu Cave (Site DJA), a limestone rockshelter site located in southeast Buka which was dated to 28,000 ± 280 BP (Wickler 2001: 68). Stephen Wickler's excavation revealed a 2.2 m stratified deposit containing flaked stone, shell debris, fish bone and other faunal remains found throughout the sequence, as well as hearth features in the upper deposits. He identified two main phases of occupation from the stratigraphy with a hiatus in between them. The first was dated to 29,000-20,000 BP (Layer II), and the second to 9000-6500 BP (Layer I) (Wickler and Spriggs 1988: 704). Wickler suggested the hiatus may have been associated with growing inaccessibility to the shoreline as sea levels fell, plummeting from -46 m at the time the cave was first occupied to a low stand of -130 m at around 17,000 BP (Wickler and Spriggs 1988: 704). Based on the types of artefacts and midden recovered and their distribution patterns, Wickler determined that the occupation of the site during this preceramic period was of a "temporary nature and involved various activities related to a hunting and gathering subsistence base…" (1995: 82). At Palandraku Cave (Site DBE), another preceramic deposit located just north of Kilu which was originally excavated by Specht (1969), Wickler made similar findings. He dated the preceramic horizon of Palandraku to about 5000 BP and interpreted from the low density of cultural material that the inhabitation of the cave was non-intensive and relatively temporary (Wickler 2001: 42).

The next oldest site in Solomon Islands is Vatuluma Posovi, which is located on Guadalcanal in the main Solomons chain and is dated to between 4000-6000 BP (Roe 1993: 176). The site was originally excavated in 1966-1968 and dated to about 3000 BP (Davenport 1968; Black and Green 1975), although Roe revised this sequence after excavating a small area of undisturbed sediment at the front of the cave. He identified five phases of occupation, and found no indication from the artefact assemblage of any significant difference in material culture between the earliest and subsequent phases, ending at around 700 BP. The assemblage comprised chert, Trochus armrings and possible Trochus fishhook blanks recovered in phases 1-4, with some additions to the assemblage - shell beads, stone adzes with lenticular cross-sections and Canarium nut anvils - appearing in phases 2 and 3 (Roe 1993: 177). In addition to his re-examination of the site, Roe's doctoral research on northwest Guadalcanal provided insight into transformations in early subsistence economic bases and the development of the importation of Malaitan chert to Guadalcanal. Furthermore, his study remains one of only a few dated sequences of prehistoric occupation of the main Solomons that overlap into pre-Lapita settlement of the region. This is one of the most poorly understood periods in Solomon Islands' prehistory, due mainly to the difficulty of locating sites which contain substantial, or sometimes any, evidence of pre-Lapita settlement. Some studies, however, have fortunately made some progress in this regard (Blake *et al.* 2015).

In summary, Solomon Islands was colonised very early on in Pacific prehistory. Although limited to the caves, Kilu and Palandraku, on Buka and Vatuluma Posovi and Vatuluma Tavuro on Guadalcanal, archaeological evidence has demonstrated phases of human occupation from the Late Pleistocene to the early Holocene at its northern end, and in the main Solomons from approximately the mid-Holocene onwards. Caves appear to have been commonly frequented places of dwelling during this time. Although noticeable gaps in their stratigraphic sequences suggest they were periodically selected and that their inhabitants were mobile and able to shift to alternative shelter. Subsistence activities appear to have been governed primarily by hunting and gathering of both marine and lowland rainforest resources. The presence of well-preserved starch grains on stone scrapers found in Kilu Cave, however, have indicated plant food exploitation (Wickler and Spriggs 1988: 705). During the mid-Holocene period, there is evidence also of overseas movement and transportation of stone tools from favoured, higher quality sources. This was demonstrated by the presence of chert at Vatuluma Tavuro in northwest Guadalcanal which came most likely from west Malaita. Overall, trends in settlement patterns and the formation of exchange networks in Solomon Islands are hinted at in the archaeological record of the Late Pleistocene to mid-Holocene, but only become far more apparent after the arrival and expansion of Austronesian-speaking communities around 3000 years ago.

1.1.2 Lapita Expansion

The expansion of Austronesian-speaking and pottery-using peoples from the Bismarck Archipelago into Remote Oceania was a significant period in Solomon Islands' prehistory. It resulted in the first arrival of people to the far eastern end of the archipelago and represented the successful colonisation of one of the most remote and biologically depauperate environments in the country. Lapita migrants brought with them new ways of living centred upon long-distance open sea voyaging, the use of pottery, inhabiting intertidal zones often on small offshore islands in stilt-house villages and subsistence strategies that were more akin to sedentary agriculture compared to the primarily hunter-horticultural style seen earlier in the archaeological record (Spriggs 1996, 1997; Kirch 1997). Central to this change in subsistence pattern was the transportation and introduction, although not always together nor at the same time, of a variety of domesticated animals and plants. For example, the earliest evidence in Solomon Islands of the domestic fowl (*Gallus gallus*) and rat, specifically the species *Rattus exulans* and *Rattus praetor*, are reported in midden assemblages excavated at Lapita sites on the Reef and Santa Cruz Islands (Matisoo-Smith and Robins 2004; Harris *et al*. 2013).

In addition to influencing transformative socio-economic and technological changes, the settlement of Lapita groups in Solomon Islands integrated the region within a vast series of networks of coloniser communities which spanned from their homeland in the Bismarck Archipelago to as far east as Samoa (Figure 1.4). These communities, who were interconnected across distances and over time by shared traditions and languages, played an instrumental role in the development of one of the most important phases of cultural transformation seen in the archaeological record of Solomon Islands and the wider Pacific. This historical and cultural phenomenon, although highly contentious and continually being redefined as archaeological study of the Pacific and Island Southeast Asia progresses (Specht *et al*. 2014), is most commonly recognised by archaeologists as the Lapita cultural complex (LCC).

The LCC developed in the Bismarck Archipelago around the mid to late-second millennium BC and is traditionally associated with a suite of cultural traits, some of which were described earlier. These include a distinctive pottery tradition known as Lapita, agricultural subsistence strategies and animal husbandry of pigs, chickens and dogs, and a coastal settlement pattern. Other important features include a distinctive ground stone adze kit and range of shell ornaments, and a widespread extension of obsidian distribution networks procured predominantly from sources in the Bismarck Archipelago (Green 2003: Table 5). Building upon Golson's (1971) notion of Lapita as a 'cultural complex', Green (1978, 1979, 2003) refined the concept by these identifying these traits as the "archaeological demonstrable core" of Lapita culture.

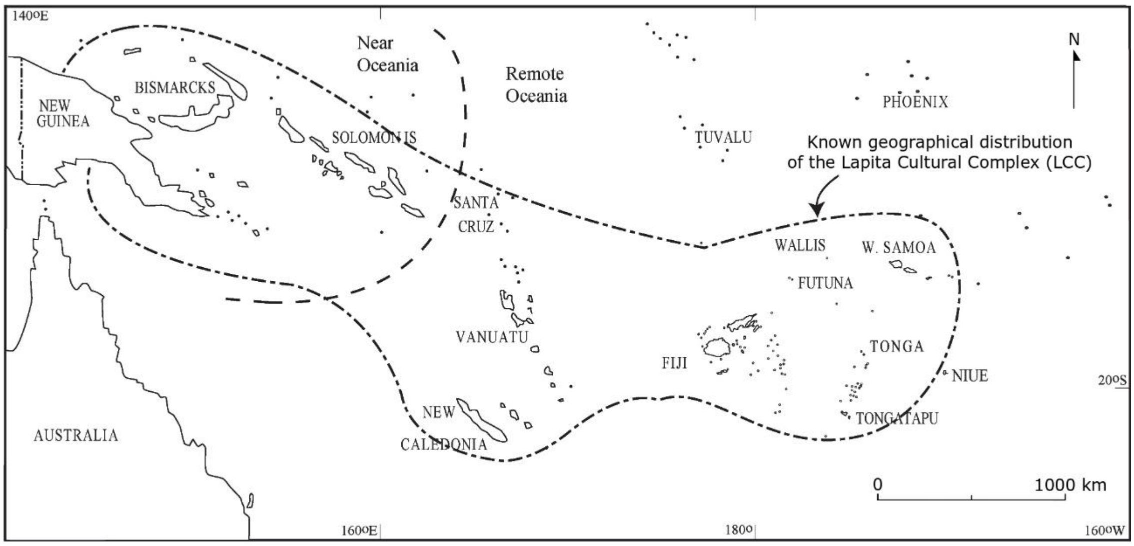


Figure 1.4 Map of the southwest Pacific showing the geographical extent of the LCC (image from Bedford 2015: Fig. 1).

Although all these traits form the 'common denominators' of the cultural complex, Lapita pottery and specifically the presence or absence of dentate-stamping is usually treated as one of the most important diagnostic elements to consider in the archaeological record. This "dentate-centric" outlook has been criticised by some archaeologists as it fails to encompass the non-dentate component of the Lapita ceramic tradition (Summerhayes 2007, 2010). This includes carinated jars decorated with a variety of styles including incision, fingernail impression, applique, single-tool impressions, grooving or lip modification, as well as utilitarian plain globular pots and bowls (Summerhayes 2007: 146). In addition to a set of cultural criteria, geographic and temporal models are commonly used to provide a more concise and detailed framework to explain how Lapita pottery changed over time and diversified between regions. Originally proposed by Summerhayes (2000b) to explain differences over time in Lapita ceramic assemblages from Mussau, the terms 'Early', 'Middle' and 'Late Lapita' are conventionally used in Near Oceanic study to order change in Lapita sites over time. Lapita has also been broken up into 'provinces' based on stylistic similarities into Far Western, Western and Eastern (Green 1978; Anson 1983). Grouping the cultural complex in this way has been effective in understanding and describing the process of

Lapita colonisation and the nature of exchange networks (Summerhayes 2000a, 2000b).

The strongest evidence in support of Lapita occupation of Solomon Islands is found in the far eastern and northern ends of the archipelago. Sites RF-2 and SZ-8, located on the southern Reef Island Nenumbo and on Santa Cruz Island, respectively, are the earliest radiocarbon dated Lapita sites in Solomon Islands with ages just shy of 3000 calBP (Sheppard *et al*. 2015). Twelve other Lapita sites are recorded in the Reef/Santa Cruz Islands, and their earliest cultural deposits are characterised by large proportions of complex dentate-stamped vessels (between 65-76% of decorated sherds from SZ-8 and RF-2) and an abundance of obsidian and chert tools. Fauna introduced to the Reef/Santa Cruz Islands by Lapita colonists included chicken, the rat species, *Rattus praetor* and *Rattus exulans*, and possibly pig (Walter and Sheppard 2017: 78). In the northern Solomons, the earliest radiocarbon dated evidence of Lapita-period occupation is from the Buka/Sohano sequence, dated by Specht (1969) to approximately 2500 BP. Wickler subsequently revised this sequence to include an earlier Lapita phase dated to around 3200-2500 BP using a seriation exercise on dentate-stamped ceramic assemblages from three intertidal sites (1990: Table 1). These included sites DAA and DAF on Sohano Island in the Buka passage and DJQ located on the northwest coast of Buka. On Nissan Island located just north of Buka, Spriggs (1991) identified three Lapita sites and created a similar and more reliably dated cultural phase of Lapita occupation for the island that spanned from 3200-2700/2500 BP. These sites included two coastal rockshelters with buried cultural deposits (DFF and DGD/2), and an intertidal site (DES) which contained on its surface decorated pottery of the Western Lapita type and later Yomining, Sohano and Late Hangan styles.

In the Western Solomons, the earliest evidence of Austronesian settlement is found in the form of artefact scatters comprised mainly of pottery decorated with incised and applied relief in intertidal zones. Over thirty of these sites have been recorded in the New Georgia group alone (Sheppard and Walter 2009: 81). A lack of stratified deposits associated with these sites has made dating difficult, although some radiocarbon estimates have been produced which support late Lapita occupation. These have been from soot preserved on the exterior of a surface sherd from Hoghoi (2850-2500 calBP) and a charcoal inclusion identified in the cross-section of a sherd from Panaivili (2340-1920 calBP) (Felgate 2003: Table 46), both located in Roviana Lagoon. Palaeobotanical evidence collected on New Georgia has provided further support of a late Lapita colonisation (Grimes 2003). Specifically, the collection and dating of pollen records by Grimes exhibited a spike in charcoal at around 2700 calBP and the appearance of vegetation that was clearly representative of an anthropologically modified landscape.

There are noticeable differences between the earliest Lapita-period assemblages recovered in the Western Solomons compared to the Buka/Nissan region and Reef/Santa Cruz Islands. Firstly, very few dentate-stamped sherds and carinated pot forms have been found in the former. Only three intertidal sites in the Western Solomons, and in the rest of the main Solomons for that matter, have shown evidence of dentate-stamped pottery (Figure 1.5). These include Zoraka on Nusa Roviana where one sherd has been found, Honiavasa located in Roviana Lagoon which contained five (Felgate 2003: 241), and Poitete located on the northeast coast of Kolombangara which had five sherds (Summerhayes and Scales 2005: Fig. 3a-e). These sherds were noted for the coarse execution of their decoration; for example Summerhayes and Scales (2005: 15) observed that the Poitete dentate stamping was applied in a "clumsy and haphazard fashion compared with the intricate stamping found in the Early and Middle Lapita assemblages further west and east". Similar to dentate-stamped decoration, carinated pots have, until this study, only been known from Honiavasa, Poitete, and Zoraka/Nusa Roviana (Felgate 2003: Fig. 7, 9).

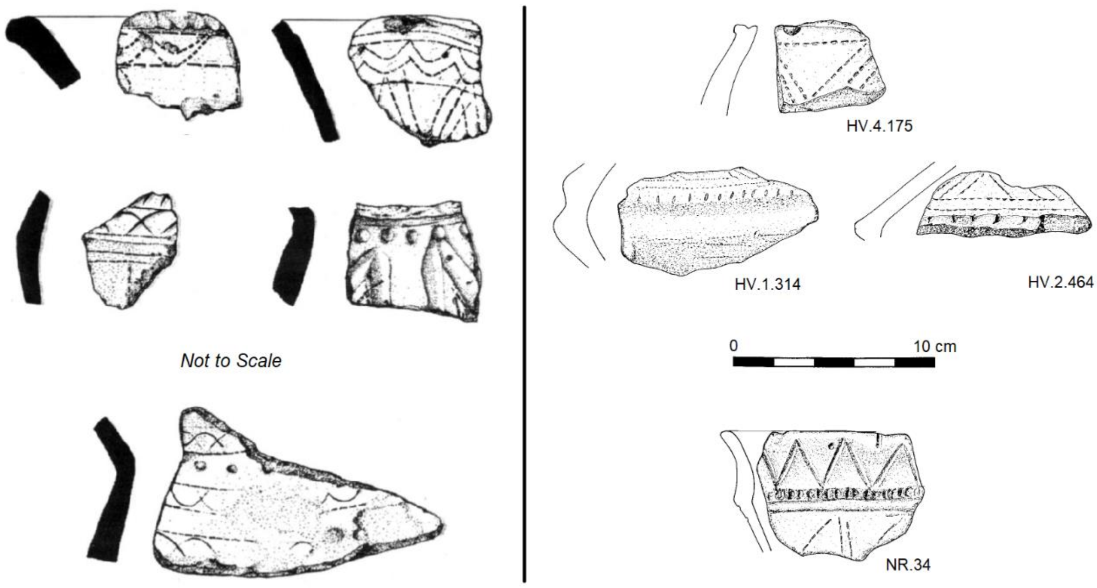


Figure 1.5 Dentate stamped sherds recovered in the Western Solomons. Left hand side: Poitete, Kolombangara, sherds (Summerhayes & Scales 2005: Fig. 2); Right hand side: Honiavasa (top right) and Zoraka (bottom right) sherds from Roviana (Felgate 2003: Figs. 7, 9, 45, 49).

The second key difference between the Lapita records of the Western Solomons and the northern and eastern peripheries is the abundance of obsidian artefacts commonly found in the latter region. Fewer than a dozen pieces have been found in the main Solomons, most of these in the New Georgia group and which have been geochemically traced to the Admiralty Islands (Sheppard *et al*. 2015: 73; Spriggs 1997: 173). One exception is a very small flake found in a post-Lapita ceramic deposit on the Arnavon Islands sourced to the Kutau/Bao chemical grouping of the Talasea region of West New Britain (Radclyffe *et al.* 2019). Finally, another important difference, prior to this study, has been an absence of any securely dated, stratified deposits in the Western Solomons dating to older than 2300 BP. Together, these differences support a late or 'delayed' Lapita occupation of the Western Solomons which is an issue that has been pivotal to understanding and modelling Lapita colonisation and movements.

The question whether the main Solomon Islands was inhabited or bypassed by the earliest migratory groups who settled most the southwest Pacific around 3000 BP, is one of the longest and most widely debated matters in the archaeological study of Solomon Islands. Prior to research carried out by Sheppard and Walter during the NGAS, two common lines of thought were used to explain the 'Lapita gap'. First, that the gap was simply an artefact of inadequate survey (Green 1978; Spriggs 1997: 128), and second, that it reflected a discontinuous distribution of Lapita that may have entailed the avoidance of the main Solomons by Lapita migratory groups due to a 'social fence' created by pre-Lapita inhabitants (Gorecki 1992; Roe 1993: 185).

More recently, Sheppard and Walter (2006, 2009; Sheppard 2011, 2019a) have proposed a 'leap-frog' model to explain a lack of evidence of Lapita occupation in the Western Solomons. They have emphasised, firstly, that there has been considerable amount of research carried out in the Solomons over the past 40 years which is comparable to the extent of research conducted before the first finding of Lapita sites in the rest of the Lapita range. Secondly, they have highlighted that there is no shortage in the Western Solomons of island environments which were clearly favoured by Lapita groups in the Bismarcks. In opposition, archaeologists including Felgate (2007), Bedford, Kirch and Thomas (see comments in Sheppard 2011) have challenged the leap-frog model. They have argued instead that the lack of evidence of Lapita occupation in the main Solomons is more attributable to an absence of evidence rather than evidence of absence. More comprehensive research, they emphasise, needs to be carried out in the Solomons for the model to be considered convincing. This issue is central to understanding and explaining the prehistoric settlement of the Western Solomons, and thus is an important point of discussion later in this study. It is equally important, however, to consider and acknowledge cultural transformations that occurred after the Lapita phenomenon.

1.1.3 The Last Two Millennia

The last two millennia was a transformational but remains a poorly documented phase in the prehistory of Solomon Islands. In this study, this period in time is referred to loosely as 'late prehistory' or the 'post-Lapita' period which signifies a transition from the late Lapita period. Specifically, in the case of the Western Solomons, this transition or the 'end' of the late Lapita period is represented archaeologically by the disappearance of the incised and applied relief intertidal ceramic sequence in the New Georgia group.

In the wider study of the Pacific, the post-Lapita period is conventionally marked by dramatic changes that arose between the middle and end of the first millennium BC in the archaeological record from some of the core archaeological characteristics which defined the Lapita phenomenon during the preceding centuries. These include the cessation of the manufacture of complex, dentate-stamped ceramic vessels and in some cases of pottery itself, as well as a general trend towards the simplification of pottery decorative styles and vessel forms and the contraction of long-distance exchange networks (e.g. Spriggs 2003; Bedford 2006: 190-192). Various explanations have been put forward to explain why these changes occurred or as some have phrased it, what brought about the 'end of Lapita' (Garling 2007). Emphasis has been placed, for example, on local adaptations (Pawley 1981) and the contraction of trade systems (Allen 1984, 1985), socio-political transformations (Friedman 1981, 1982), as well as secondary migrations (Bellwood 1989) and the progressive assimilation of non-Lapita and Lapita cultures (see summaries of all models and their main advocates in Spriggs 1997: 152-61). Of the many changes that occurred in the archaeological record at this time, the disappearance of dentate-stamped vessels and predominance of new ceramic traditions such Incised Applied Relief (IAR) are some of the most widely deliberated amongst Pacific archaeologists.

There are two main bodies of thought surrounding the issue of the decline of Lapita pottery and emergence of the IAR tradition. The first and possibly most widely held view is an argument for cultural continuity (Spriggs 1984, 1993; Wahome 1997).

Spriggs, Wahome and other researchers who have shared this view (Galipaud 1996; Kirch 2000: 162) have contended that continued connections and regional interaction carried on during the post-Lapita period as is reflected by similarities in IAR ceramic traditions from different regions including Mangaasi in Vanuatu and the Sohano style of Buka. Moreover, under this argument, the identification of the IAR tradition across the southwest Pacific was representative of a secondary 'Melanesianised' wave of migration following Lapita.[2] The second body of thought emphasises the localisation of ceramic traditions in the post-Lapita period ensued by long-distance interaction making a resurgence within the last millennium as Polynesian colonising groups expanded into the central Pacific. Lead drivers of this argument, Bedford and Clark (2001; Clark 2000, 2003; Bedford 2006), suggest that resemblances between post-Lapita styles such as Mangaasi and other IAR assemblages from Manus to New Caledonia are superficial. Similarities and changes in these pottery styles, they argue, derive not from continual interaction but from a shared inheritance from Lapita and through cultural drift brought about by isolation.

Some scholars have suggested a more even-handed outlook (Garling 2007: 258), highlighting that a "more nuanced picture of interaction at the 'transition' requires both continuity and discontinuity". In her doctoral study of the Tanga Islands located northeast of New Ireland, Garling demonstrated evidence for the persistence of certain elements that were probably ultimately Lapita-derived, but which occurred amid considerably greater evidence of dramatic but not wholesale change. Important continuities from Lapita included for example the use of red slip, particular lip motifs and vessel forms (mainly the outcurving-rimmed form and a few carinated vessels), and the maintenance of obsidian exchange networks and subsistence practices (Garling 2007: 257-258). These continuities occurred in harmony with noticeable transformations including the employment on ceramics of new decorative motifs and techniques as well as changes in compositional styles which Garling interpreted to be indicative of groups that were constituted by social networks and identities that were no longer characteristically Lapita.

[2] Recent genomic research has revitalised the argument for subsequent, repeated waves of migration and population replacement following Lapita colonisation of Remote Oceania (Skoglund *et al*. 2016; Lipson *et al*. 2018; Posth *et al.* 2018; also see forums and reviews by Bedford *et al.* 2018; Spriggs 2019; Spriggs & Reich 2019).

In Solomon Islands, assessing evidence of continuities and discontinuities from the preceding Lapita phase is made difficult due to several reasons. Walter and Sheppard (2017: 90) have found, for example, that in areas where pottery continued to be manufactured or imported, sequences are generally poorly defined and serve little more than a signification of human presence. While in areas where ceramics ceased or were never made, they evaluate that “there is only an ephemeral record at best for the first millennium AD, followed by a gradually increasing density of remains until the historic period” (Walter and Sheppard 2017: 90). Despite these limitations, and in order to establish at least some form of understanding about what important cultural changes were occurring at this time, it is important to highlight what previous archaeological and palaeobotanical research has shown.

Field investigations concentrated in the Eastern Solomons have contributed some insight. In the Reef and Santa Cruz Islands, following the replacement of decorated Lapita pottery with plainware, which is identified from around 2700-2600 BP, ceramics rapidly began to disappear. The use of pottery ceased altogether approximately 500 years later and occurred contemporaneously with a marked drop in obsidian imported from the Bismarck Archipelago (Green 2003: 107). Another and perhaps one of the most important developments that occurred near the end of the post-Lapita period was the arrival of Polynesian populations to the Eastern Solomons, specifically to Tikopia, Taumako and Anuta. Dating suggests that this occurred most likely within the last 800 years or so as a back-migration from the east (Spriggs 2000: 351; Kirch and Swift 2017: 333). The migration is demonstrated by the appearance of a Polynesian suite of artefacts including Western Polynesian stone adze forms, trolling lures and pig tooth necklaces. In addition, this is supported by linguistic evidence (Wilson 2012) and the presence of Polynesian ‘rocker-jaw’ mandibles and other skeletal remains recovered in large burials on Taumako (Leach and Davidson 2008: Appendix 2).

In the main Solomon Islands chain, one of the most informative accounts of the post-Lapita period is Roe’s (1993: 182-184) cultural sequence of Guadalcanal. He proposed three phases of prehistoric occupation of Guadalcanal: the *Hoana* (Forest) Phase (6400-2200 BP), *Hamosa* (Grassland) Phase (2200-1500 BP), and *Moru* (Garden Re-growth Vegetation) Phase (1500-150BP). The Hamosa Phase was represented by a reorientation in settlement patterns from occupation being focused on inland caves to open settlements located on ridge crests and slopes as well as flat plains near swampy terrain. Palaeobotanical evidence indicated that this occurred in unison with an expansion of both dry field and irrigated agriculture as shown by an intensification in forest clearance, erosion and the growth of *Themeda australis* grass plains which characterise much of modern-day northwest Guadalcanal. Near the end of the Hamosa Phase there was also evidence of the introduction of *Rattus exulans*, possum (*Phalanger orientalis*) and pig (Roe 1993: 183). The Moru Phase witnessed a recommencement of the inhabitation of caves and rockshelters located near the coast as well as the first substantial occupation of inland forests. The latter took the form of small hamlets and nucleated villages and the employment of intensive arboriculture and swidden agriculture. Roe argued that this diversification of the economic base and the growth over time of communities occupying these two different environmental zones were integral to the development of a social distinction between 'bush' and 'saltwater' peoples which has been widely documented in ethnography (Hocart 1922; Fox 1924).

In the Western Solomons, the archaeological record shows something of a gap during most of the post-Lapita period. In the New Georgia group, this is most apparent between about 2000 to 1000 BP and has been attributed most likely to a decline in the usage of ceramics or the intensity of coastal settlement (Thomas 2009: 122). Grimes' (2003) palaeobotanical research on New Georgia has provided some insight, demonstrating a similar pattern seen on Guadalcanal of human impact on forest ecosystems intensifying considerably from around 2500-1000 BP, and continuing to the present. From this, Walter and Sheppard (2017: 141) have argued that it was highly likely intertidal zones located in prime locations near passages and fresh water were continued to be occupied after the cessation of the ceramic tradition. Field investigations carried out by Tim Bayliss-Smith and others at Kusaghe located inland in northern New Georgia have highlighted extensive evidence of irrigated taro terracing (Bayliss-Smith and Hviding 2012, 2014). Recent radiocarbon dating of an excavation at a terrace, however, suggests that these taro agricultural systems developed in late prehistory, from around the fourteenth century (Bayliss-Smith *et al.* 2019: 40).

Only with the emergence of shrine construction at around 800 calBP does the archaeological record of the New Georgia region prove to be more informative. Walter and Sheppard (2017) describe the development of religious and spiritual shrine landscapes as part of the Munda Tradition, comprising an early Bao Period (700-400 BP) and later Roviana Period (400-100 BP). These phases were defined by a transition from the construction of early 'faced-platform' shrines using mainly large basalt slabs and, to a lesser extent, coral slabs to a more predominant use of coral rubble to form low mounds (Table 1.1).

Table 1.1 Attributes of Bao and Roviana shrines (from Walter and Sheppard 2017: Table 7.1).

Period	Wall Construction	Human Bone	Table Stones	Shell Valuables*
Bao (n=24)	Basalt	None	Common	Absent (n=24)
Late Bao (n=8)	Coral Slabs	None	Uncommon	Absent (n=3) Present (n=5)
Roviana (n=79)	Coral Rubble	Present (n=46)	Absent	Absent (n=14) Present (n=32)
		None (n=33)	Absent	Absent (n=13) Present (n=20)

*Number of shrines in brackets.

These structures differed also by the presence of offerings of human bone, shell valuables and historic artefacts including trade axes which were associated predominantly with the later Roviana shrine forms (Thomas 2014: 51-57). Differences are also exhibited between house structures in the New Georgia group in the Bao and Roviana Periods. Nagaoka (2011: 302), for example, has written “that in contrast to earlier [Bao] house sites which possessed simple foundations, raised stone platforms and terraces on Nusa Roviana… suggest increased labour investment and attention to the building of permanent dwelling”. Additionally, shrines in the Roviana Period were built in close proximity to dwelling spaces whereas they were spatially segregated in the Bao Period, signifying heightened entanglement of spiritual and domestic spaces.

These architectural and social changes were tied to a dramatic shift that occurred in settlement patterns from being heavily biased towards inland settlement in the Bao Period to far denser inhabitation of the fringes of Roviana Lagoon and Nusa Roviana in the Roviana Period (Nagaoka 2011). This occurred following the dispersal of Roviana-Kazukuru from inland New Georgia to the coasts in the sixteenth century AD which led to the development of large, nucleated settlements and powerful coastal polities on Nusa Roviana (Sheppard *et al*. 2004). Overall, socio-political transformations that arose in the Western Solomons in the last millennium were dramatic. This is exemplified by significant changes that occurred over time in shrine forms, ritual assemblages and settlement patterns. The culmination of these changes indicate the emergence during this period of a new social order and ideology centred mainly upon ancestor veneration (e.g. Aswani 2000; Nagaoka 1999, 2011; Sheppard *et al.* 2000; Thomas 2009; Sheppard and Walter 2013). Similar cultural developments are likely to have arose in late prehistory in Choiseul and Isabel, although our understanding remains shallow due to our poor comprehension of the archaeological record of these regions.

1.2 Research Design

The overall goal of this study is to contribute towards building a more complete and comprehensive archaeological sequence for Solomon Islands. Focus is placed specifically on the Western Solomons where, in the last two and a half decades, considerable improvements have been made in building our understanding of the archaeological record of the region and the prehistory of its peoples. Despite these improvements, the archaeology and prehistory of large areas of the Western Solomons such as Choiseul and Manning Strait have remained obscure due to a lack of archaeological surveying. This study contributes towards addressing this and expanding our knowledge about the prehistoric colonisation of the Western Solomons and the development of socio-economic and cultural interaction in the region.

The design of this study is influenced by and shaped in concordance with previous culture historical investigations of Solomon Islands directed by Green (1976; Green and Cresswell 1976), Sheppard and Walter (2006) and others (Roe 1992; Specht 1969; Wickler 1995). These studies, which represent some of the most significant and comprehensive surveys carried out in the country, were originally founded with a primary objective to create or refine existing cultural sequences and to make inferences upon changes in the sequences about the formation and spread of cultures. One of the main approaches of the Southeast Solomon Island Culture History Project (SSICHP), for example, was centred upon "tracing back cultural continuity in unbroken sequences at various localities so as to separate different groups on the basis of their archaeological assemblages, and from them infer an approximate time for their arrival in the area as well as their probable origin" (Green 1976: 17).

The main research aims and questions of this study, which are set out below, were designed to generate a foundational level of knowledge about the prehistory of the Manning Strait region. Tackling complex questions about the long-term development of socio-economic interaction and cultural diversification is difficult in any regional archaeological study, and especially for this area of the Western Solomons where the archaeological record is poorly known. Previous exploratory studies carried out in Solomon Islands have highlighted the importance of establishing a temporal framework of the cultural sequence of the region under investigation first before attempting to address more specific problems of change within the archaeological record (Specht 1969; Wickler 1995; Roe 1992).

Taking a similar approach, this study investigates the what, when and where questions important to addressing our lack of understanding of the culture history of this area of the Western Solomons. Emphasis is placed primarily on the timing and nature of prehistoric settlement, mobility patterns and the development of trade and exchange networks. This study then draws theoretically from a cultural landscape approach and concepts utilised in island archaeology, which are examined in Chapter 2, to discuss how and why factors may have changed over time and how they influenced the formation and diversification of cultures in the region.

1.2.1 Research Aims and Questions

The main research aims of the study and their corresponding research questions are as follows:

1) Develop an archaeological sequence for Manning Strait and assess how it fits into current sequences and models of prehistoric settlement of the Western Solomons.

    1a - When and from where was Manning Strait first settled?

    1b - What archaeological or cultural traits characterise the earliest settlers of the region?

    1c - How do these characteristics change over time from initial settlement in the late Lapita period leading into the historic period?

This research aim and its corresponding questions are targeted at refining archaeological sequences available for the Western Solomons. Walter and Sheppard (2017: Fig. 7.10) have proposed a four-phase archaeological sequence for Roviana based on over two decades of multidisciplinary research in the region. These phases, which were described earlier in this chapter, include a Late Lapita Period (2700-2000 BP), an Aceramic Period (2000-1000 BP), Bao Period (1000-400 BP) and Roviana Period (400-100 BP). Findings made from field research carried out as part of this study in the Manning Strait region, including the discovery of a late Lapita ceramic site in northwest Isabel and the excavation and radiocarbon dating of both ceramic and aceramic deposits in southeast Choiseul and the Arnavon Islands, are integrated within the model to put forward a revised cultural sequence for the Western Solomons. This revised sequence is presented in Chapter 10.

2) Investigate the nature, extent and development over time of prehistoric trade and exchange networks in Manning Strait.

    2a - What inferences can be made from the movement of exchange items regarding the mobility of prehistoric communities in Manning Strait, and what evidence is there of change over time?

    2b - How did the production and distribution of pottery, stone tools and shell valuables influence the development of exchange networks and cultural interaction in Manning Strait?

    2c - Does the archaeological evidence of the transformation of trade and exchange patterns support a historical trend of progressive contraction and regionalisation seen in wider Island Melanesia (Allen 1984)?

The primary intention of this research aim and its corresponding questions was to improve upon our understanding about how interaction networks and the mobility of prehistoric communities changed over the *longue durée* in the Western Solomons. To achieve this, laboratory analyses were carried out on ceramics, lithics and shell valuables that were collected during the field expeditions to Manning Strait. Emphasis is placed predominantly on findings from stylistic and compositional analyses of pottery, and this data is used to discuss the role of Choiseul operating as a hub of pottery production and distribution throughout much of Western Solomons' prehistory. Broadening the scope of this inquiry to include what has been observed historically in wider Island Melanesia, findings from the laboratory analyses are also synthesised and compared against Allen's (1984) model of Melanesian exchange. This model is described in more detail in Chapter 2.

3) Assess the role Manning Strait played in hindering or fostering interaction during prehistory and examine how this may have influenced cultural development in the region.

    3a - Was the sea channel inhibiting or facilitating interaction between communities in Isabel and Choiseul, and how did this change over time?

3b - Is there evidence in the archaeological record of Manning Strait to support a trend seen in the last millennium in New Georgia of increasing cultural diversification and the formation of regional identities (Thomas 2009)?

3c - How does the historical development of settlement and socio-economic interaction in Manning Strait compare to other archaeological studies of straits in the Pacific?

This research aim draws theoretically from the archaeological sub-discipline of island archaeology. Specifically, it incorporates important concepts from the field such as insularity, interaction and various types of 'scapes' which are discussed in Chapter 2. Under this theoretical framework, agency is given to the environment in which the prehistoric communities were living in and the primary intention of this is to gain a more holistic understanding about the diverse ways in which the long-term trajectory of intercommunal interaction in the Western Solomons was shaped in the past. Attention is given not only to what was facilitating interaction across and within Manning Strait but what also acted as barriers to interaction. In Chapter 10, findings from this investigation of Manning Strait are compared against similar archaeological studies of Bougainville Strait (Irwin 1972), Torres Strait (McNiven 2004, 2006, 2015) and Vitiaz Strait (Lilley 1989). This is done to contextualise processes of cultural change in Solomon Islands within a wider regional outlook, and to assess similarities and differences between the formation and diversification of cultures within these seascapes during prehistory.

1.2.2 Field Objectives and Methods

A three-pronged approach has been taken to address the research aims and questions, drawing upon archaeological field research, laboratory analysis and reviewing ethnographic and historical literature. Oral historical information collected in the field and the rich body of ethnographic and historical literature documenting Solomon Islands and Melanesian cultures are integrated into this study to make comparisons with the archaeological findings. This has been carried out to provide a more multidimensional discussion of long-term trends in the development of cultures in the Western Solomons and the mobility and patterns of interaction of its inhabitants. In the remainder of this section, I explain my field objectives and the analytical techniques used in the study of material culture collected during fieldwork in Manning Strait.

The field research was guided by three objectives:

1) To survey the region and improve upon the recorded distribution of archaeological sites in and around Manning Strait using a geomorphologically informed approach.
2) To build upon a temporal framework of the prehistoric occupation of the region using excavation and radiocarbon dating.
3) To analyse material culture, namely pottery, lithics and worked shell artefacts, as proxies for broader social movements in prehistory such as colonisation, migration, exchange and innovation.

Pottery

- A formal analysis is carried out on pottery collected from seven sites in Manning Strait with an emphasis placed on examining differences and similarities in vessel form, decorative techniques and technological attributes.
- These are correlated with compositional groupings which are established on the combined basis of macroscopic fabric analysis and geochemical characterisation using a scanning electron microscope (SEM).
- Clay and sand samples collected in the field are included in the geochemical analysis.

Lithics

- Technological groupings of lithics, consisting primarily of chert collected in northwest Isabel as well as the Arnavon Islands and southeast Choiseul, are formed using attribute analysis with an emphasis placed on assessing inter-site variation in flake usewear and core reduction techniques.

Worked Shell

- Stylistic groupings of shell valuables, namely shell rings, are formed using attribute analysis in combination with ethnographic and archaeological literature.
- Descriptions of technological differences in the stages of manufacture of the Choiseul traditional shell money ring known as *kesa* and other shell valuables common to the Western Solomons are given.

Faunal Remains

- Faunal analyses of two stratified midden deposits from Wagina and the Arnavon Islands, dated to the late and post Lapita periods, are carried out to examine changes over time in prehistoric subsistence patterns.

1.3 Chapter Content

The remainder of this thesis is divided into nine chapters. Chapter 2 develops the theoretical framework utilised in the framing of the research aims and interpretation of results generated from the fieldwork and laboratory analyses. Chapter 3 provides an overview of the physical geography, population distribution, linguistic diversity and biological ancestry of Choiseul, Isabel and the Arnavon Islands. In Chapter 4, ethnographic and historical literature relevant to Solomon Islands is systematically reviewed to provide a contextual backdrop for this archaeological investigation. The review focuses especially on incorporating oral histories and traditional knowledge of Choiseul and Isabel peoples concerning their origins and distant past.

Chapter 5 gives an explanation of the field methods and presents findings from the surveying, excavations and radiocarbon dating carried out on new sites in the Manning Strait region. An overview of archaeological research that has previously been carried out on Choiseul, Isabel and the Arnavon Islands is also given in this chapter. Chapters 6 and 7 present findings from stylistic and compositional analyses carried out on pottery recovered in Manning Strait. The methodological approaches taken in these analyses is explained at the outset of each chapter. Chapter 8 presents results from descriptive and technological analyses carried out on lithics gathered in Manning Strait. Chapter 9 provides a descriptive summary of shell and coral artefacts recovered during field research in Manning Strait and presents results from an analysis of the excavated faunal remains. The approach taken to identifying and quantifying the faunal remains is explained in the chapter.

Finally, in Chapter 10, the reviewed ethnographic and historical literature and results presented in Chapters 5 to 9 are synthesised and discussed in relation to the research aims and questions presented earlier in this chapter. Existing modelling of the prehistoric settlement and development of networks of interaction in the Western Solomons are re-evaluated, and a revised cultural sequence for the Western Solomons is proposed. Furthermore, the role of Manning Strait in shaping processes of culture change over the *longue durée* is discussed and recommendations for future research are given.

Chapter 2 Straits, Seascapes and their Archaeology

This chapter lays out the interpretive framework utilised in this study which draws principally from culture history and island archaeology. It is divided into five sections. The first gives a brief historical and theoretical backdrop to the way straits in the Pacific have been studied by anthropologists and archaeologists. Special attention is given to three well-studied regions: Vitiaz Strait, Torres Strait and Bougainville Strait. The second section examines theoretical and methodological applications of culture history in archaeology. Within this section, an evaluation of the strengths and weaknesses of culture history is given. The third section narrows down our attention to themes central to the archaeological sub-discipline of island archaeology, specifically isolation, interaction, trade and exchange, and seascapes. In this section, models put forward to explain the development of exchange systems in Melanesia over the last few millennia are deliberated. The fourth section focuses more specifically on the Western Solomons, and reviews regional investigations into inter-island interaction and forming cultural sequences. The final section synthesises these bodies of theory, drawing together the strengths of previous studies of straits in the Pacific and from culture historical research and island archaeology, and summarises the theoretical framework employed in this study.

2.1 Strait Archaeology

A strait is defined as a narrow passage of water that connects two larger bodies of water and is typically navigable unless too shallow or disrupted by a reef. In addition to acting as 'sea bridges', straits lie between and act as water barriers between large landmasses. Archaeologists and anthropologists have studied straits for more than a century (e.g. Jenness 1928). Over time, theoretical and methodological approaches taken to learning about indigenous communities who inhabited these environments have varied considerably. This is examined in the remainder of this section which is structured into two parts. The first part focuses on archaeological studies carried out in the Pacific, specifically in Torres Strait, Vitiaz Strait and Bougainville Strait. The second part is a summative discussion about the transformation of the ways archaeologists have studied straits. Within this discussion, explanation is also given as to how the present study attempts to integrate itself within theoretical frameworks that have been applied in studies of these environments. This explanation is expanded upon in more detail at the end of the chapter.

2.1.1 Studies of Straits in the Pacific

One of the earliest anthropological studies of a strait was the Cambridge Anthropological Expedition to Torres Strait which was launched by Alfred Cort Haddon in 1898. Although Haddon's initial purpose of visiting Torres Strait was to study marine biology, he became engrossed in learning about and documenting the traditions of indigenous Torres Strait Islanders which he feared were rapidly disappearing. He was also drawn to study these communities because, as he wrote, "owing to their isolation, they have been less modified by contact with alien races" (Haddon 1898: 174). Following this, Haddon planned the 1898 expedition which served as a 'salvage' ethnographic study and was one of the first multidisciplinary anthropological field projects of its kind (Haddon 1898). Accompanying him on the expedition, among others, was William H. R. Rivers and Charles Seligman who later became recognised as highly influential anthropologists of their era**.** Significantly, the study has been credited with having influenced the development of anthropology as an institutional discipline as well as the integration of direct field research with scholarly interpretation (Herle and Rouse 1998: 2).

In addition to the Cambridge Anthropological Expedition to Torres Strait, many of the first anthropological studies of straits in the Pacific were undertaken by ethnographers. Notable examples include Thomas Harding's monograph on Siassi trade networks in the Vitiaz Strait (Harding 1967) and Blackwood's documentation of folk stories and other cultural, gender-based and economic practices in Buka Passage (Blackwood 1932, 1935). In more recent times, extensive archaeological research has been carried out in the Bass Strait located between Tasmania and the Australian mainland (Bowdler 2015; Jones 1987; Sim 1998; Sim and West 1998). Additionally, in New Zealand, the Foveaux Strait and Cook Strait have received considerable attention (Coutts 1972; Jacomb *et al.* 2010; Leach 1978; Leach and Davidson 2002). In their project 'Bridge and Barrier', Foss Leach and Janet Davidson (2002) directed an intensive investigation of Cook Strait. The project was multidisciplinary, incorporating archaeological, ethnoarchaeological and historical research, and was centred upon examining the role of the sea channel in facilitating early interactions between horticulturalists in the

North Island of New Zealand and hunter-gatherers in the South Island, as well as contact between Maori and European.

Other prominent examples from the Pacific include investigations of Torres Strait (Lawrence 1994; McNiven 2015), Vitiaz Strait (Lilley 1987) and Bougainville Strait in the Northern Solomons (Irwin 1972; Terrell and Irwin 1972). These three examples are examined in greater detail below for two reasons. One, they relate culturally, temporally and are located near the area currently under investigation. Two, they showcase three different approaches that have been undertaken by archaeologists in an investigation of a strait and the prehistory of its inhabitants.

In Torres Strait, a major archaeological investigation into the prehistory of the region and of Torres Strait Islanders has been carried out by Ian McNiven (2006, 2015). Over the course of the research, which began in 1996, McNiven has placed emphasis on understanding the social, economic and spiritual lifeways of Torres Strait Islanders and the way this has transformed since occupation began in the region approximately 9000 years ago. Torres Strait Islanders are, as McNiven describes, “marine-specialised groups dispersed across numerous island communities with large territorial seascapes” (McNiven 2015: 40). One of the communities he has worked with closely, the Kulkalgal, are sea navigators and in the past inhabited some of smallest and most impoverished islands in the region – the Central Islands. With considerable environmental limitations, McNiven has highlighted that the Kulkalgal helped offset this through maintaining an expansive and dense network of social relationships both amongst themselves and with neighbouring groups (McNiven 2015: 50). Another driver for the maintenance of these social networks was communally shared beliefs in Dreaming cosmology and ritualised dugong hunting and midden practices associated with it. Seascapes, in this sense, were formalised as ‘spiritscapes’ which were engaged through these ritual performances (McNiven 2004: 329).

Anthropologist, David Lawrence, has also examined customary exchange in Torres Strait (Lawrence 1994). Central to his paper was the contention that customary exchange across Torres Strait was not a system of fixed, formalised, point-to-point trade routes as had been suggested by past scholars who had been too heavily reliant on historical documentary sources (Haddon 1890; McCarthy 1939; Moore 1979). Instead, oral histories and material culture comparisons suggested that customary exchange was flexible and open, tied to changing social, political and cultural factors and operated within a framework of a dynamic Melanesian economic system (Lawrence 2004: 241).

Similar arguments were made by ethnographer Thomas Harding in his monograph on Siassi trade networks in the Vitiaz Strait (Harding 1967). He described the trade system, which linked several hundred communities located on west New Britain and the northeast mainland of New Guinea, as a “vast interpersonal network” (Harding 1967: 243). Common trade items included taro and other vegetable crops used for festive and daily consumption, pigs, pottery and other craft goods and ornaments made from dog teeth, giant clam shell and turtle shell. The demand for the circulation of these goods, Harding found, stemmed from certain mechanisms comprising both social and economic values and motives. For Siassi communities living on small, depauperate islands within the strait, restocking supplies of garden crops was dependant on external trade. Another key mechanism driving trade in the region was prestige. This was expressed in a politico-ceremonial system directed by Siassi big-men and involved meetings in ceremonial men’s houses where trade expeditions were organised and profits distributed. Other mechanisms responsible for driving trade were the use of delayed reciprocal forms of exchange and special elaborations of the division of labour. “Without consideration of these [mechanisms],” Harding contended, “the trade system is not intelligible” (1967: 154).

Archaeological research undertaken in the Vitiaz Strait, which has been headed by Ian Lilley initially as the focus of his PhD with ANU (Lilley 1987), has contributed considerably to understanding how the Siassi trade system developed over time. Building upon earlier investigations of exchange systems in the Bismarck Archipelago carried out by Irwin (1983, 1985), Allen (1984) and others (Specht 1969), Lilley’s study demonstrated that the exchange network documented by Harding appeared to have emerged only within the last 300 years. Lilley uncovered evidence of an intermittent Lapita presence in the Siassi Islands dated to between 2500-2800 BP, which was suggested as a possible progenitor to the historic trade systems. He found, however, that evidence of an ancestral system to the Siassi trading system only convincingly began appearing from around 1600 BP.

The emergence of a ‘proto-system’ of long distance exchange in Vitiaz Strait around this time was indicated in the archaeological record by the sudden appearance of three distinct pottery styles and evidence of cross-strait transfer of pottery, obsidian and probably chert (Lilley 1987: 470). Lilley formed a cultural sequence for the region and named this period of exchange activity the Sua-Tambali phase (Figure 2.1).

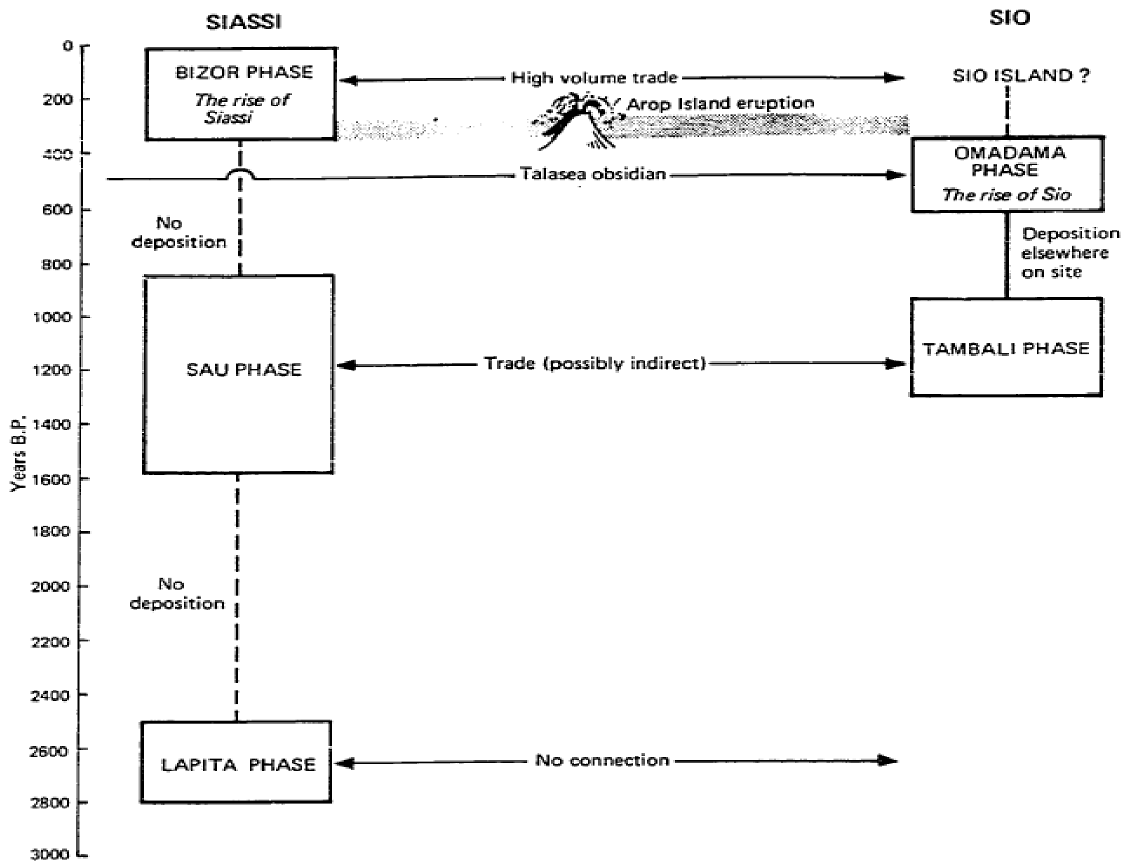


Figure 2.1 Prehistoric regional sequence in patterns of exchange in Vitiaz Strait. (Figure from Lilley 1987: Fig. 11.1).

While exchange networks ancestral to the Siassi trading system appeared to have developed during the Sua-Tambali phase, Lilley emphasised that there were clear distinctions between them and the ethnographic trade network documented by Harding. One key difference, for example, was the lack of ethnographically recorded valuables such as pig, dog and shell beads in Sua-Tambali phase deposits. Lilley contended that this implied "the 'protosystem' may have not been motivated by the demands of big-man rivalry in the way that the historic system was" (1988: 515). Thus, the former may well have involved similar trade patterns of material goods but while operating under a different form of socio-political organisation. From his research, Lilley concluded that despite their antiquity, regional interaction systems in the Vitiaz Strait and in wider Island Melanesia exhibit considerable fluidity of structure and content over short periods of time. Additionally, the most complex cultural systems such as the Hiri, Kula and Mailu are likely to have developed into their ethnographically recorded states only very recently (Lilley 1987: 485).

In Bougainville Strait, which is a passage about 40 km wide located between southern Bougainville and northwest Choiseul, archaeological research has been carried out by Geoffrey Irwin (1973, 1972). As part of a Masters project with the University of Auckland, Irwin carried out a survey of the Shortland Islands, located within the strait. His survey, which he carried out over a couple of months in 1970 primarily on Alu Island, the largest of the island group, was an investigation of prehistoric site location, distribution and population. Due to a paucity of previous archaeological knowledge about the Shortlands, Irwin did not approach his study with a finite research problem and highlighted that his work offered a "preliminary appraisal of Shortland Island prehistory" (1972: 6). He selected three sites to excavate which together possessed surface collections which covered most of the range of ceramic variation noted during his reconnaissance surveys. These included Kasinai (A-8) – a midden and ceramic deposit, Purupuru (Z-1) - a raised midden site on Purupuru Island, and Pirumeri (A-3) - a 150 sq. m surface scatter of pottery and other artefacts at the village of Pirumeri. From his excavations and collection of surface sherds, he created a chronology of human occupation of the Shortlands, classified into Early (1040 ± 95 BP), Middle and Late Periods (Irwin 1972: 99, 103). Using the archaeological data in addition to ethnographic and ecological data, Irwin also identified two functional classes of sites. These were 'permanently occupied coastal villages', whose houses were "arranged in a long straggling row", and small outlying 'hamlets' located inland (Irwin 1972: 231).

Irwin also co-authored a paper with John Terrell analysing and critiquing historical writings about the Torau migration (Terrell and Irwin 1972). The Torau migration was a movement of people from Alu Island and Mono, another major island of the Shortlands group, to southern Bougainville. It took place in the 1860s and retains a prominent place in Shortland Islands' oral tradition. In their study of the migration, Terrell and Irwin put forward a revised model of Torau prehistory using the addition of archaeological evidence to oral history and historical literature. They argued that the record of their settlement on Bougainville cannot easily be written from oral traditions of the northern Solomons as previous scholars had done (Bulmer 1971; Laracy 1969).

Challenging the notion often used in these studies of one-off large-scale 'migrations' to explain cultural diversity and differences, Terrell and Irwin emphasised that there was ongoing interaction in the Bougainville Strait probably beginning in prehistory. This was supported by the lack of stylistic variability in ceramics manufactured in the region which showed uniformity geographically from island to island and temporally, both before and after the presumed date of the migration. At the time of European contact, interaction in the area is documented to have included trade and hostility, intermarriage and general movement back and forth Bougainville Strait. In summary of the evidence, Terrell and Irwin concluded that interaction was likely to have been occurring frequently enough to designate the area as a “regional communications network” or “interaction system” (Terrell and Irwin 1972: 340). They named this region or sphere of interaction, which was likely to have also included northern Choiseul, the “Bougainville Strait Interaction System” (*Ibid*: 345).

2.1.2 Discussion

As has been demonstrated, a wide array of approaches have been taken by archaeologists and anthropologists to studying straits and indigenous communities inhabiting them. Some of the first major studies carried out near the start of the twentieth century, such as the Cambridge Anthropological Expedition to Torres Strait, focused primarily on investigating cultural origins and traits, and were strongly influenced by Darwinism and cultural evolution. Most scholars of this era approached their studies under the belief that islands were ideal candidates for the study of cultural processes as they were home to isolated, ‘untouched’ cultures. This belief was tested somewhat following the reconceptualization of culture as a mixture of traits and assignable attributes to a more a pluralistic and relativist view of culture which understood it as a patterned whole characteristic of a group or people. This was influenced by British social anthropologists such as Malinowski and Radcliffe-Brown and American cultural anthropologists, notably Franz Boas (c.f. Erickson and Murphy 2008: Chp 2). Only until the last several decades, however, with the development of more holistic conceptions of islands not as separate entities but as interlinking nodes within spheres of interaction has the recognition of islands as cultural time-capsules been properly debunked.

In Oceania, research carried out in Torres Strait, Vitiaz Strait and Bougainville Strait by archaeologists McNiven, Lilley and Irwin demonstrate three different approaches that have been taken to studying straits. Irwin’s (1972) Masters study of Bougainville Strait, which was smaller in scale in comparison to the other two researchers, was fundamentally a landscape and survey-focused investigation of prehistoric site distribution. His chronology of occupation of the Shortland Islands provided insight into how settlement patterns and pottery styles changed over time. In addition, Irwin’s finding of a lack of stylistic variability in ceramics recovered on the island group was important to his later paper with Terrell in which they argued that ongoing interaction, rather than one-off largescale migrations, was an imperative force behind cultural change in the region (Terrell and Irwin 1972).

Lilley similarly formed a sequence of occupation of Vitiaz Strait, however, his research was more heavily focused on investigating the nature and evolution of prehistoric exchange systems in the region. Building upon a wealth of ethnographic data that had been recorded about exchange practices of Siassi Islanders within the strait as well as the Hiri, Kula and Mailu, Lilley argued from his examination of the archaeological record that these trade systems developed only within the last few hundred years. From his findings, he refuted that exchange systems that operated during the Lapita period were a key progenitor to the development of the ethnographic trade systems. Moreover, Lilley contended that a possible 'proto-system' emerged from around 1600 BP. A fundamental difference between the proto-system and ethnographic trade systems was evidence of a greater complexity in socio-political structuring of the systems seen in the latter.

In contrast to Lilley and Irwin's studies, McNiven has placed greater emphasis on examining social, economic and spiritual lifeways of Torres Strait Islanders in the past. Kulkalgal Islanders, as McNiven has argued, were very reliant on trade for subsistence needs and this practice shares close resemblance to Lilley's model of 'subsistence trading' seen across much of Island Melanesia. Dreaming cosmology and ritual performances, such as dugong hunting and midden practices, McNiven argued, were also equally as important to the formation and maintenance of social networks in Torres Strait. McNiven conceptualised Torres Strait, in this sense, as home to multiple territorial seascapes through which engagement with ritual performances also became formalised as spiritscapes.

The current study combines a seascape-focused theoretical outlook such as McNiven's with the more traditional culture historical approaches undertaken by Lilley and Irwin. Given the lack of previous archaeological surveying that has been carried out in Manning Strait, forming a foundational appraisal of the archaeological record and prehistoric settlement of the region represents a crucial first step. Generating from this data insightful understanding about how exchange patterns, interaction and isolation impacted upon processes of cultural change and diversification represents the second important step. The development of such an interpretive framework is expanded upon in the following two sections and is summarised at the end of the chapter.

2.2 Culture History: Origins and Explaining Culture Change

Culture history, and the practice of defining societies into distinct ethnic and cultural groupings, has remained one of the most dominant theoretical paradigms that has guided prehistoric archaeology across the globe. It began developing in the nineteenth century amid a period of European Enlightenment, scientific breakthroughs in biology and evolution, and a growing sense of nationalism (Lyman *et al.* 1997a; Trigger 2006; Webster 2008). Some early influential cultural historians, such as Jens Worsaae and Gustav Kossina, were staunch nationalists whose studies sought to enhance popular and political recognition of the nation through a demonstration of its long history (Murray 2017). While others, such as notable heliocentrists Grafton Smith and William Perry, were motivated more so by a search for the 'essence' of humankind and employed diffusionist ideas to describe the rise and evolution of civilizations in the past.

Cultural historical archaeology formally emerged in the 1930s. It developed following the gradual professionalisation of the field of archaeology and served as a theoretical soundboard upon which data-poor speculations made by nineteenth century unilinear evolutionists could be challenged or expanded upon (Gibbon 2014). The development of processual archaeology in the 1950s and '60s, followed by a post-processual movement which arose shortly after, completely reshaped the way culture history was perceived and used by archaeologists. Processual archaeologists created and framed their more process-focused paradigm in response to shortcomings of the culture historical approach. Some of these inadequacies included an emphasis on description and an ineffectiveness to *explain* cultural change, and idealist interpretations of typological and sampling effects being misrepresented as empirical reality. Despite having flaws, culture history retains a central role in the discourse of archaeological research.

The remainder of this section explores this in more detail and is structured into three sections. The first examines the culture area model and describes its historical and theoretical development, as well as its application in archaeological study of Solomon Islands. The second discusses the fruition from the culture area approach of 'communities of culture' and the development of the concept of 'communities of practice'. The third is an overview of key strengths and weaknesses of culture historical archaeology which are important to recognize when using this approach to investigate long-term cultural change.

2.2.1 Culture Area Model

The anthropological concept of a 'culture area', defined as a province or region characterised by a suite of shared cultural traits, is rooted in theoretical advancements such as taxonomy that were made in biology and evolutionary theory during and shortly after The Enlightenment (Pauls 2009). The more formally recognised use of the concept or a 'culture area' approach is most distinctly associated with American anthropologist and once assistant of Franz Boas, Clark Wissler. Wissler combined Boas' model of cultural relativism – the proposition that cultural differences should not be judged by absolute standards - with a cultural traits approach developed by evolutionists to examine indigenous cultures of the Americas. He published his findings in *The American Indian* (1917). In it, Wissler defined fifteen culture areas in North, Central and South America based on thirteen categories including, among others, subsistence patterns, material culture, social organisation and environmental zones. Wissler's culture area research was significant for its time as it provided anthropologists with not only an exemplary case study but also necessary theoretical foundations to undertake cross-cultural comparisons that were not fundamentally dependant on evolutionary models (Pauls 2009). The culture area approach was further developed by Alfred L. Kroeber who published important works such as *Cultural and Natural Areas of Native North America* (1939). In addition, its adoption by others such as geographer, Carl Sauer, disseminated the culture area approach to an even broader audience.

Today, few anthropologists and archaeologists use this culture historical approach, and the culture areas originally described by Wissler and others are seen by most social scientists to no longer exist or at least to be representative of an out-dated and static model of cultural studies. One of the fundamental issues with the concept lies in selecting the criteria upon which a culture area can be defined. Who or what determines the key traits, traditions and processes of a given culture? Furthermore, what levels of internal similarity are required to sufficiently define a culture area? Another central issue is its terminological implication of being an 'area'. As a cultural area or province, where or what delimits its boundaries? Also, can a culture area converge or diverge over time or then does it lose what made it a culture area in the first place?

Despite having limitations, the cultural area approach has served as a valuable model in archaeological study of Oceania for investigating cultural origins and modelling cultural divergences and change over time (e.g. Skinner 1921; Burrows 1940). This has particularly been the case in the development of archaeological study of Solomon Islands, exemplified by cultural historical research initiated by Roger Green as part of the Southeast Solomon Islands Culture History Project (SSICHP). One of the first major ethno-archaeological studies carried out as part of SSICHP utilised a culture area approach. This was led by Sidney Mead who carried out an ethnographic study of art styles and material culture in the Star Harbour region of Makira in the 1970s (Mead 1973, 1976, 1977). Mead found that the Star Harbour region possessed strong culture historical links with the rest of Makira and neighbouring islands including Ulawa and South Malaita. Underlying these links, he contended, were "a common core of cultural traits, some of which result from common ecological factors, some from redistribution through trade and some from historical relationships" (Mead 1973: 58). Examples of the 'core' or shared traits included architectural style, shell and teeth money, and the ceremonial importance of pig and bonito fish. Mead described this region of shared ideas and practices as the Eastern Triangle culture area (Figure 2.2).

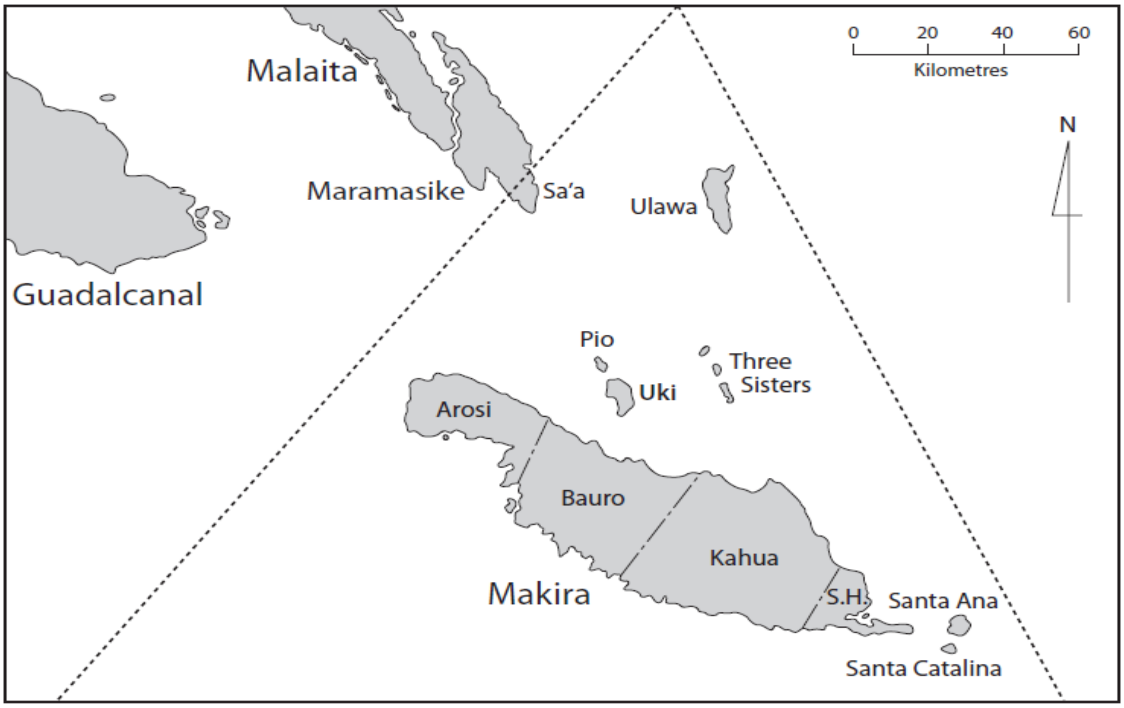


Figure 2.2 Map of Eastern Triangle culture area. (Image from Walter and Green 2011: Fig. 2.1).

Mead argued that the Eastern Triangle culture area was characterised by being an active and dynamic social system. Importantly, this contrasted with previous static portrayals of Melanesian cultures described by prominent ethnographers of the region, Rivers (1914) and Fox (1919, 1924). Rivers and Fox placed a disproportionate amount of emphasis on migrations in explaining cultural change over time. While Mead focused more on understanding and documenting the various processes of interaction that supported the development of distinct art areas. Walter and Green subsequently expanded upon Mead's model of an Eastern Triangle culture area in a 2011 monograph about the village of Su'ena, located off the northern coast of Makira on Uki Island (Walter and Green 2011). In the study, the authors emphasised two key features of culture areas. Firstly, the distribution of traditions which define the culture area and, secondly, the nature of the social networks which link and integrate member communities and facilitate various modes of transmission (Walter and Green 2011: 6). They illustrated this using the metaphor of a net which comprised interconnecting vertical and horizontal strands (Figure 2.3).

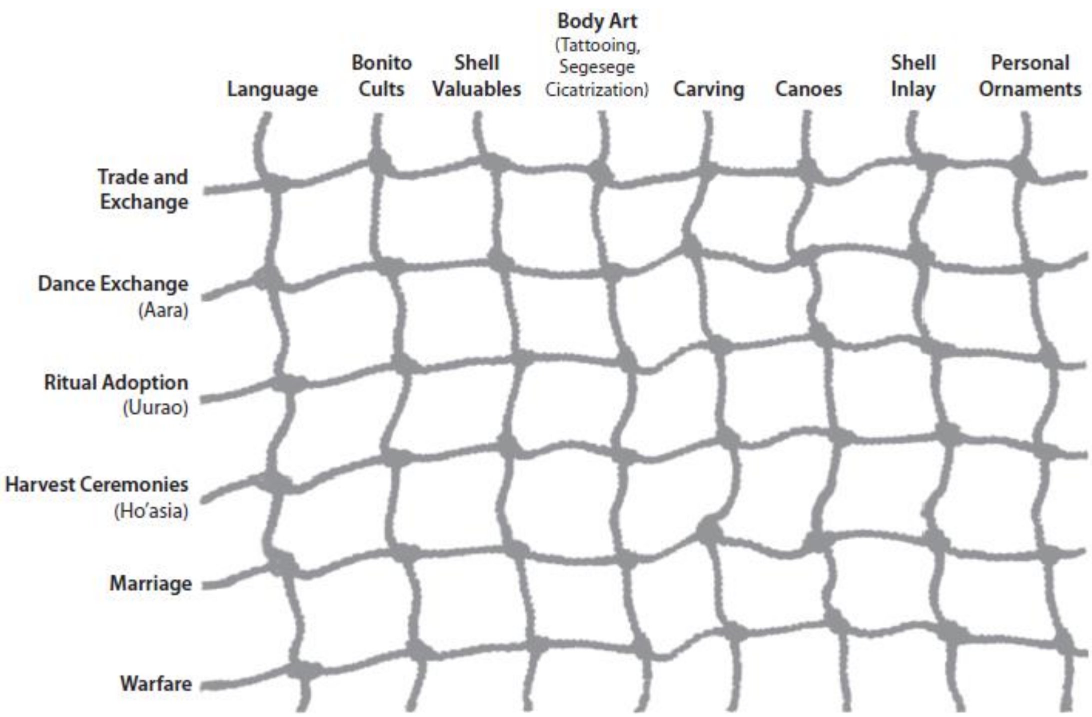


Figure 2.3 Eastern Triangle culture area as a net with cultural traditions as vertical strands and modes of transmission as horizontal strands. (Image from Walter & Green 2011: Fig. 2.2).

By depicting the Eastern Triangle culture area in such a manner, Walter and Green highlighted how certain traditions in Melanesia, such as trade and exchange, are almost impossible to separate from other social interactions and institutions. Furthermore, a key argument the authors put forward was that focusing solely on one strand within a network of socially significant relations is too narrow a focus. A more effective means of examining and explaining a culture area as a dynamic social phenomenon would require an approach that draws on archaeology, ethnography and oral tradition. This definition of a culture area that is not purely focused on traits and is more fluid in encompassing the temporally and socially dynamic nature of culture change approaches the meaning of similar theoretical concepts of 'communities of culture' and 'communities of practice'.

2.2.2 Communities of Culture and Communities of Practice

In a similar manner to the culture area concept, 'communities of culture' implies shared cultural participation that is characterised by the presence of the same or similar traditions, objects and beliefs (Phillips and Willey 1953). In Pacific archaeology, one of the first times the phrase 'communities of culture' was employed was by Jack Golson in his well-known 1961 review of archaeological findings that had been made in the region since WWII. In the review, which included descriptions of Gifford's discovery of pottery on New Caledonia and Tonga with "extremely mannered and well-executed" decoration that later became known as Lapita pottery, Golson strongly questioned the ethnographic boundary, as it was then understood, between Polynesia and Melanesia (1961: 169). In light of emerging evidence of a distinct ceramic tradition being uncovered on New Caledonia, Tonga and possibly emerging in Samoa and the Bismarck Archipelago, Golson proposed that "some early community of culture" once linked these areas of the Southwest Pacific (1961: 176). This community, he conjectured, predated the 'Melanesian' cultures of New Caledonia and were ancestral to the historic Western Polynesian cultures of Tonga and Samoa. In addition to Golson's study, the concept has occasionally reappeared over the years in archaeological literature in the Pacific (Welsch *et al.* 1992; Spriggs *et al.* 1993). A similarly worded but distinctly theoretically-rooted concept, 'communities of practice', has also been utilised by Pacific archaeologists (Chiu 2012; Gaffney 2016; Szabo 2005; Terrell 2014; Thomas 2009) and has been highly influential across multiple areas of research in the social sciences.

The concept of 'communities of practice' has developed as a central idea in 'situated learning' – where learning is recognised fundamentally as a social process and not solely in the mind of an individual (Lave and Wenger 1991). Based on ethnographic method and social theory, the concept has been highly and widely influential in studies of business management, psychology and educational theory (e.g. Cox 2005; Wenger

2010). Anthropologist, Jean Lave, and computer scientist, Etienne Wenger, who coined the term, put forward a relational rather than a strictly spatial approach to the definition of a community. Within this definition, communities are characterised by the relations between members with less emphasis placed on genealogical and cultural ties and more on day-to-day practices. In other words, the concept has no presuppositions regarding the nature of social features which define the communities under examination (Kelly 2016: 32). They can, for example, be kin-based or not, or they may include professional guilds, informal reading groups or artistic communities such as opera singers. Practice-based communities, from the viewpoint of Lave and Wenger, are not spatially bound and can transcend space even at the global level (e.g. see Amin and Cohendet 2004).

Archaeologist, Carl Knappett, has applied this more relational definition of communities of practice to an examination of 'meso-networks' – a scalar analytical framework of networks including also micro and macro scales (Knappett 2011: Chp 5). Using Cretan Bronze Age towns as a case study, he demonstrated how spatial proximity is not always a reliable indicator of social proximity. Knappett illustrated from an examination of pottery made in Knossos how houses on opposite sides of the town were much 'closer' in their practice than immediate neighbours. He warned, however, that the physical spatial component cannot be completely forgotten when examining 'communities of practice'. This is particularly the case for reconstructions of artefact spatial distribution which can be a pragmatic issue in prehistoric archaeology as well as an interpretive one. He concluded with the recommendation that by defining communities using sets of practices and by tracing the spatial recurrence of the practices and their material structures, "we may be able to trace different kinds of communities and hence understand something of the character and pattern of interaction at the meso-scale" (2011: 106). Other archaeologists who have employed the concept have stressed the point, however, that "we should not necessarily equate any set of apparently similar material culture with a community of practice" (Kelly 2016: 32; see also Brubaker 2002). The existence of such communities in the past requires testing against the archaeological record and demonstration through multiple lines of evidence such as styles of material culture, technology and social and spatial relations.

In archaeological study of Solomon Islands, Thomas (2009) has used the 'communities of practice' concept to place greater emphasis on examining social interaction, identity, and the way communities in the Western Solomons were interconnected and divided in the past. Using results from his surveys of New Georgia, Rendova and Tetepare (Thomas 2004), he proposed that the late period sequences of Rendova and Tetepare were indicative of engagement in a shared community of practice that also included New Georgia. Prominent aspects of this community included head-hunting, shell money production and exchange, and ceremonial shrine construction. The material emergence of this set of social practices over approximately the last five centuries, which are delineated in both the archaeological and ethnographic records, Thomas argued, "facilitated management and control of group membership, attachment to place, and successful action in the world" (2009: 129). Expanding upon this, he argued that the shared practices developed as a regional phenomenon rather than as something that began in a single centre and was emulated by others. Classifying a people or region as part of a culture area, Thomas warned, can obscure our understanding of processes giving rise to diversity, and can neglect gaining a better understanding of the particular nature of practices that were shared (2009: 141). He explained that he prefers the terminology, 'community of practice', as "it has a higher fidelity to what was actually going on at the time, and because it has more explanatory power encouraging us to attend to the role those practices played in defining 'community'" (2009: 141).

The development of these shared practices in the Western Solomons during the historic period, Thomas concluded, were instrumental to the formation of regional identities. They enabled the formation of structured relations, such as the role of mediators in exchange or the dichotomy between enemies and friends in head-hunting, which, in turn, separated parties into defined wholes. From this, Thomas argued that understandings of difference were enabled to be worked out at a regional (or 'meso') scale and represented an amplification of related practices which functioned earlier in prehistory on a more local coast/inland division (2009: 141). Over the long term, he believed, that "what we are probably seeing… is the evolution of a network, variously contracting and reconnecting, with different nodes joining in or dropping out in the process, but ultimately guided by a common understanding of practical ways for negotiating relations" (Thomas 2009: 141).

Overall, a similar viewpoint of the definition and value of a 'community of practice' approach advocated by Thomas (2009), Knappett (2011) and originally founded by Lave and Wenger (1991) is taken in this study. This is discussed at the conclusion at the end of this chapter. As the 'communities of practice' concept is partly rooted from ethnography and traits-based archaeology, it is important to understand the underlying weaknesses and strengths of culture history.

2.2.3 Strengths and Weaknesses

Before assessing the strengths and weaknesses of culture history to archaeological research, it is important to first establish an understanding of some of its other key tenets and underlying assumptions. Numerous authors have done this previously and examined the rise and fall of culture historical archaeology in far more detail than what is presented here (Lyman *et al.* 1997ab; Trigger 1989; Webster 2008). Nonetheless, a teasing out and discussion of the key strengths and downfalls of the approach is considered essential to explaining and justifying the theoretical weight given to culture history in this study. Two core features of culture history I wish to highlight are its multiple definitions and perceptions of culture, and the pivotal role of classification and typology within the approach.

A central notion of culture history in the early to mid-twentieth century was that past societies could be sub-divided into various 'cultures' by identifying differences and similarities in the material record. In this sense, culture was perceived to some extent in a binary manner, divided between 'cultural whole' and 'cultural units' or partitive cultures. Partitive cultures were seen to constitute empirical or 'real' divisions of the cultural whole. While the premise that cultures were also bound together by common and distinct sets of norms, and thus enabled them to be studied as whole and contained entities, was a normative view of culture. Cultures in this partitive-normative sense were also understood to behave in a fluid manner and were commonly described using metaphoric references to 'ripples' or 'cultural streams' (Webster 2008: 13). The 'flow' or sometimes abrupt changes in these cultures were typically attributed to diffusion or migration and invasion. The introduction of 'archaeological cultures' by Gordon V. Childe (1929) improved somewhat upon these perceptions of culture. This concept viewed the archaeological record as not the culture itself, but rather as its cultural product: the objectified or materially expressed norms of the culture or cultures that produced it (Webster 2008: 13). Today, the concept of an archaeological culture is rejected by some archaeologists (Shennan 1989). Archaeological cultures are increasingly seen as summary descriptions of patterns of spatial and temporal variation in material culture that were produced by numerous factors. Rather than serving as an explanatory model, they more closely represented phenomena which needed to be explained in specific circumstances (Trigger 2006: 310).

Another key tenet of culture history is the use of classification and typologies to examine the historical development of cultures. The method, which was developed into its more or less standard form in the mid-twentieth century by Rouse (1952), involved grouping artefacts according to material then sub-dividing them on the basis of function, decoration, techniques of manufacture and so on (Webster 2008: 13). In outcome, a hierarchical or taxonomic series of classes and sub-classes was produced from which artefact 'types' could be formed. Types – defined by Rouse (1960) as a series of attributes which are shared by such a group of artefacts and which distinguish them as a class – could then be used to define cultural units and examine their distribution over space and time. Importantly, Rouse differentiated 'types' which were artificial groupings or creations of archaeologists from 'modes' which were inherent within an assemblage or, as he described, "natural units of cultural study" (Rouse 1960: 318). Rouse identified modes as being either 'procedural' which referred to the behaviour of the artisan or 'conceptual' which consisted of ideas or designs expressed by the artisan.

Prior to the advent of radiocarbon dating and dendrochronology, frequency seriation was the primary method used by culture historians to establish the relative age of artefact types. Cultures, which were seen to be continually evolving through time (as a 'culture stream'), could be sliced into arbitrary periods using seriation in combination with 'diagnostic' or 'marker' types. The preoccupation amongst culture historians with identifying artefact 'types' derived from the materialist-essentialist notion that archaeology was principally the study of the interrelationship between three dimensions of the archaeological record. These included the *form* of artefacts, and how various forms were distributed across *space* and *time* (Spaulding 1960; Willey 1953a). This notion, which holds significance for the practice of classification and mainly for the study of prehistory, is now recognised as an over-simplification of archaeological practice and materiality particularly following the incorporation of post-processual idioms (Shennan 1989; Hodder 1991).

Having examined some key tenets and underlying assumptions of culture historical archaeology, attention can now be given to evaluating strengths and weaknesses of the approach. Even with the development of processual and post-processual schools of thought, culture history, I argue, has retained several strengths for the study of prehistoric societies. Key advocates of culture history, Trigger (1989, 2006) and Webster (2008), have previously expressed this viewpoint. One of these strengths is its classificatory or typological approach to studying past societies which is widely recognised as a crucial building block of archaeological practice. Culture historians facilitated an essential stage in the evolution of the discipline by laying the necessary classificatory foundation. Prolonged debates about artefact classification between figures such as Ford and Spaulding were significant as they resulted in the first substantial manifestation of the concern of archaeologists to articulate and make explicit the analytical basis of their discipline (Trigger 2006: 299). In many ways, culture history served as a vital prelude to processual and functional studies of prehistoric cultures.

Another quality of this approach is that cultural historical information, such as archaeological sequences and the spatial and temporal variation of cultural traits, is typically seen as a prerequisite for addressing wider problems when carrying out research in a new region. This has been exemplified by numerous archaeological studies carried out in Solomon Islands (e.g. Green 1976; Walter and Green 2011) and throughout much of Oceania (e.g. Green 1972; Davidson 1978; Kirch 1987; Shaw 2014). Furthermore, once initial chronologies and other culture historical reconstructions have been formed, another advantage of this approach is that they can be continuously evaluated and revised over time. As methodological techniques continue to be refined and sites and assemblages are studied in more detail, this can contribute towards the 'cumulative credibility' of culture histories (e.g. Childe 1956: 35). In Europe, Classical archaeologists, in particular, have taken advantage of this in the deconstruction and refining of regional cultural sequences (e.g. Biers 1987; Webster 1996; Morris 2000; Erickson 2010). Culture history no longer holds a central position in theoretical discourse in anthropology, although its basic principles and concepts continue to profoundly influence archaeological thought and practice around the world. To understand how the applicability and relevance of culture history has declined over time, it is important to examine its main criticisms.

One weakness of culture historical archaeology is the inherent danger, which comes with studying any society or phenomena of the past typologically, of confusing a typological creation with empirical reality. Early culture historians sometimes failed to realise that while cultural types *may* have had sociocultural meaning, their main purpose as analytical tools were for building chronologies and examining cultural variation across space and time. Overlooking this often resulted in the conflation of cultural units and interpretations of them (see studies by Phillips and Griffin in Phillips *et al.* 1951). The importance of reflexivity and recognising the influence archaeologists can have on the reconstruction of the past has only become more apparent with the development of modern and post-modern thinking (e.g. Hodder 1999).

Another weakness was a mistake made by early culture historians of not acknowledging the distinction between homologous and analogous similarities, the latter signifying functional convergence rather than shared ancestry (Lyman *et al.* 1997a: 6). Patterns of similarity or difference identified between cultural units, in this manner, were often 'explained' using ethnologically documented historical processes such as diffusion, migration, trade and innovation. Little attention was given to acknowledging or examining the criteria and conditions which guided the detection of those cultural patterns in the first place. The failure to distinguish analogous from homologous traits, Lyman and authors (1997a: 6) have argued, "resided in the lack of a theory of culture development or evolution applicable to archaeological materials".

This brings to attention another shortcoming of culture history, advocated by notable critics Lyman, O'Brien and Dunnell (1997ab), that it lacks a theoretical framework to explain or model cultural variability. These authors have argued that greater emphasis has traditionally been placed by culture historians on describing and formulating cultural types from the archaeological record, as opposed to having the principle aim to *explain* variation seen between the types.

Considering the strengths and weaknesses that have been outlined, it is clear culture history has inherent limitations as is the case for any theoretical method utilised in anthropology (c.f. Murray 2017: 9). More importantly, however, culture historical sequences can be of immense value to the formation of a foundational understanding about the prehistory of a region or people from which wider research problems can be addressed. Additionally, these regional sequences can be continuously evaluated and refined over time as techniques advance and further research is carried out. This is carried out in this investigation of Manning Strait in partnership with a landscape-centred approach commonly utilised in island archaeology, which is expanded upon below. It is argued here that a culture historical approach can be further strengthened by combining it with a more holistic viewpoint of the cultural landscape under examination, in this instance, seascapes. Moreover, this perspective places greater appreciation on the historically dynamic role of the environment and other culture ecological factors that shaped long term cultural processes.

2.3 Island Archaeology: Exploring Ecological and Social Relationships

Islands have long been considered ideal settings for modelling evolutionary and ecological relationships as they are typically smaller and more limited in biodiversity compared to continents. Charles Darwin famously demonstrated this in his study of finches on the Galapagos Islands (Sulloway 1982). Recognition of islands also possessing value for the study of the human past and cultural evolution can be traced back just as early in history. Describing the Pacific, British physician and ethnologist, James Prichard, wrote that "these insular countries are distributed through almost every variety of climate, and contain abundant diversity of local situation; therefore, they afford us an opportunity of observing whatever influence physical causes may be supposed to exert over our species" (Prichard 1813: 248-249). Within this passage, Prichard raised two important qualities of islands. One – insularity – which captures the spatial and physical boundedness of islands. And two – diversity – which in this case he mainly referred to the wide range of environmental and climatic conditions of Pacific archipelagos as well as hinting to the complex 'situations' or histories of Oceanic societies. These qualities have remained at the heart of much of the historical development of anthropological and biogeographic studies of islands.

Anthropological study of islands formally began to take shape in the 1950s, and matured in the '60s and '70s following a growing influence of genetic research, culture ecology and processual archaeology. Prominent Pacific anthropologists Mead (1957), Goodenough (1957) and Sahlins (1957) were some of the first academics to examine islands as laboratories in the modelling of cultural evolution. They were followed by a landmark study on island biogeography published several years later by ecologists MacArthur and Wilson (1967). Contemporaneous studies by American anthropologists, Vayda and Rappaport (1963), and British archaeologist, John Evans (1973), further expanded anthropological and archaeological engagement of islands as laboratories around the world. More in-depth reviews of these studies and the historical development of island archaeology are provided by Terrell (1997) and Spriggs (2008).

Today, notions of island communities representing 'closed societies' with long periods of undisturbed cultural development are considered by most anthropologists and archaeologists as misleading and underlain by Eurocentric, 'mainland' bias (Rainbird 1999). Greater emphasis is usually placed on assessing the role of mobility and interaction in influencing cultural trajectories, as well as acknowledging the agency of maritime communities in successfully navigating between barriers as well as creating barriers themselves. Notions of seascapes and islandscapes are at the forefront of this field of research (Gosden and Pavlides 1994; Broodbank 2002; Rainbird 2007). In the case of the Pacific, I argue that Epeli Hau'ofa's (1994) postcolonial construct of the region as a 'sea of islands', as opposed to islands within an expansive sea, is of prevalence to these notions and is valuable in explaining and understanding the formation of identities and the mobility of Oceanic peoples.

The remainder of this section expands upon the varying approaches archaeologists have taken to the study of island societies and is structured to provide a brief theoretical backdrop to three central themes within this field of study. The first is the dual concepts of interaction and isolation. In this section, the various ways archaeologists have perceived these concepts and interpreted evidence of them from the archaeological record are examined. The second section touches on the study of trade and exchange, and discusses modes of production and distribution which have been put forward to understand how prehistoric economies operated and were organised. Special attention is given, in this section, to models that have been put forward to explaining the evolutionary development of exchange systems in Melanesia. Lastly, the third theme is centred on the variable forms of 'scapes' and how archaeologists have drawn on this conceptual framework to study prehistory and culture change.

2.3.1 Interaction, Isolation and Barriers

Isolation, and its opposing concept interaction, are often inseparable from the study of islands and island peoples. Islands are by their very nature insular environments. Ecologists and biologists have exploited this fact to model genetic differentiation, examining factors such as 'isolation-by-distance' which assumes that greater distance can lead to higher genetic differentiation (Wright 1943). In archaeological study of the Pacific, a similar approach has been taken in the use of an isolation and interaction model (Weisler 1997). A basic principle of the model assumes that continued contact is inferred from similarities in material culture, while divergence is a response to cessation of external interaction.

One of the first Pacific archaeologists to place emphasis on this model in explaining noticeable changes in the material record seen from the Lapita period was Janet Davidson. In a summary of archaeological findings made in Fiji and Western Polynesia, she wrote that similarities seen between ceramic sequences in the area was "circumstantial evidence for continued contact and exchange of ideas over a period of 1500 years, whereas there is nothing to indicate the rapid breakdown of an extensive communication network" (Davidson 1978: 378). Over the years, this interpretive model and its assumption that "isolation is… a fundamental condition fostering divergence" (Weisler 1997: 12) has been widely applied to interpretations of culture change in Pacific prehistory. This has especially been the case in studies of remote islands groups in Micronesia and Polynesia such as Easter Island (Hunt and Lipo 2008) and other 'Mystery Islands' (Kirch 1988; Weisler 1996). While physical isolation can be a critical condition of any society's prehistory, I argue that it is as equally important to acknowledge and examine other 'barriers' and factors that may have acted upon cultural change.

Examining processes and the effects of isolation and interaction on prehistoric cultures requires an understanding of what barriers and boundaries existed and were created by societies in the past. This research theme has been widely applied to the study of prehistoric migrations, economics state formation as well as ethnicity (Stark 1998). Barriers and boundaries come in many forms. Environmental barriers such as deserts and mountain ranges, which are a prominent discourse in palaeoanthropology and studies of early hominin migration (e.g. Erlandson 2010; Wurster and Bird 2016), are important as they can physically separate and seize intercommunal interaction. A notable barrier in the Pacific is the sea passage demarcating the division between Near and Remote Oceania which has been pivotal in reconstructing Austronesian expansions and colonisation of the region (Pawley and Green 1973; Irwin 1989; Spriggs 2000). In Solomon Islands, evidence of discontinuity in the fairly uniform distribution of dentate-stamped Lapita pottery found in Island Melanesia continues to generate debate as to whether or not the region was bypassed by Lapita migratory groups.

In addition to being physical, boundaries can be social manifestations. In *The Archaeology of Social Boundaries*, Miriam Stark and authors (1998) have outlined the complexity of social boundaries and challenges involved in delineating them and their effects from the archaeological record. "Groups signal boundaries", Stark (1998: 8) wrote, "using different media from one another, and upon occasion, do not signal boundaries at all.” Furthermore, studies of these boundaries have commonly demonstrated how the relationship between style and social boundaries is highly contextualised (Stark 1998: 9). Welsch and Terrell (1998), for example, in their chapter on material culture and exchange on the Sepik Coast of New Guinea, argued that the construction of alliances between ‘friends’ through the exchange of goods and marriage partners was instrumental to the creation of ‘social fields’. These ‘social fields’ or ‘communities of culture’, which bound together individual villages and sometimes groups of villages, cross-cut multiple ethnolinguistic boundaries so could not be adequately categorised as culture areas or ethnic groups (Welsch and Terrell 1998: 60). In Solomon Islands, an important social boundary widely documented by ethnographers was a division between ‘saltwater’ and ‘bush’ peoples (e.g. Woodford 1890: 9; Rivers 1914: 232; Hogbin 1964: 50). Roe (2000: 214) has since highlighted the contextual and often fluid nature of this division, arguing that while “the generality of the bush-saltwater divide must be acknowledged… it [can] mask a great deal of diversity and propensity for dynamic change.”

Interaction has been defined by archaeologists as a “form of intergroup communication” (Weisler 1997: 13) or reciprocal engagements between two parties (Knappet 2011). Knappett, a notable author on the topic, has written that archaeological approaches to the study of interaction have commonly been geometric or primarily spatially-oriented. Interaction, in this manner, has been defined by two key characteristics. The first is that interaction “takes place within an absolute physical space, without altering the nature of that space” and, two, that “it occurs at the macro-scale” or at a regional level (2011: 16). At its heart, however, Knappett has emphasised that interaction is far more complex than that and can occur on a number of different levels and scales. Furthermore, he has described the many ways geographers, social anthropologists and archaeologists have alternatively studied interaction using top-down, bottom-up and multi-scalar approaches. Of these, he argued that a network approach provides a particularly effective method to studying relations between people and objects in the past (Knappet 2011: 57-58). This is because networks permit analysis between scales and can allow for both geometric and topological understandings of spatial relations.

‘Networks’ can be defined simply as a “set of items… with connections between them” (Newman 2003: 168). The term is sometimes used interchangeably with the phrase ‘spheres of interaction’ (e.g. Sheppard *et al.* 2015). Knappett (2011: 10) has put forward that networks offer archaeologists five methodological advantages. First, they coerce us to consider the relations between entities which is applicable for examining assemblages and interactions between artefacts. Second, they are inherently spatial and can be both social and physical. Third, networks can articulate between scales and fourth, they incorporate both people and objects. Lastly, network analysis encompasses a temporal dimension which is valuable to unravelling complexities of how spatial patterns are created by processes over time. Network analysis, which draws from Actor-Network Theory (Latour 2005), involves thinking explicitly in terms of nodes and links, and exploring the different topologies that networks may have and how they can affect patterns of interconnection (Knappett 2011: 33). Rather than assuming an intrinsic primacy of humans over non-humans, this approach treats these two categories symmetrically in social formations. This is particularly useful, I argue, when assessing the influence of non-human or physical barriers on disrupting or altering social inter-group interaction and the formation of social processes over time.

2.3.2 Trade and Exchange

One of the most effective methods for archaeologists to study the development of prehistoric networks or spheres of interaction is through an examination of the production and movement of material goods. On islands, archaeological study of trade and exchange is particularly constructive as geological or biogeographical restraints of these insular environments can provide clear evidence for the importation of exotic goods. On a downside, this arena of research is usually restricted to the study of items that preserve over time within the archaeological record. Thus, food and other perishable items which may have been common or even vital items within exchange systems can go unrecognised or underrepresented. Notable authors on the topic, Ericson and Earle (1982: 3), state that prehistorians studying exchange have three interrelated jobs: "to source the commodities of exchange, to describe their spatial patterning and to reconstruct the organisation of the prehistoric exchange". Since the 1980s, this has come to be recognised as common practice by most archaeologists studying trade and exchange. An important distinction can be made, however, between two schools of thought which have governed the way archaeologists have modelled patterns of exchange. These include the formalist approach which operates within a paradigm of market economics, and the substantivist approach which views exchange as being embedded in social as well economic processes (Summerhayes 2001).

Formalists use cost minimisation models, for instance, to understand the outcome of rational decision-making regarding choices available to a population. Substantivists, conversely, assume that economies are embedded within, and thus should not be detached from, socio-political institutions. Symbolism is sometimes used in the latter approach to demonstrate broader patterns of social and cultural context that may be reflected in patterning of exchange goods (Hodder 1982ab). Ericson and Earle (1982: 3) recommend that a theoretical approach which draws from both the formalist's notion of individual rationality and the substantivist's emphasis on social context and systematic interaction can be of value to archaeological study of prehistoric economies. A more balanced theoretical stance such as this is taken in this study.

As a branch of economic anthropology, the study of trade and exchange draws upon numerous economic terms and concepts (Firth 1950; Polanyi 1957; Sahlins 1974). Three concepts are particularly relevant to this study. These are the fundamental distinction between commodities and gifts (Mauss 1970), the various modes under which trade or exchange has been practised in the past (Renfrew 1975), and the scale under which these economic transactions or exchanges took place. Marcel Mauss (1970) is credited for demonstrating that in networks of exchange, particularly in self-sufficient societies which are commonly found in the Pacific, many of the goods can take the form of gifts. Also, more importantly, these gifts can have far more than purely economic significance. In contrast to commodities which can be sold or traded based on the economic value of the product, gifts typically embody a different form of 'value' – one which can accumulate *mana* or prestige, reciprocal favours and services.

Reciprocal exchange is seen in this manner as a continuum of forms, with one end of the spectrum representing gifts used 'positively' as a currency of everyday friendship and kinship where a return is considered unthinkable and unsociable. While on the other end, gifts can be presented tactically for self-interest and self-gain. Competitive feasting can fall within this bracket of more 'negative reciprocity' (Gouldner 1960). Another important point Mauss emphasised, in unison with Malinowski and Sahlins, was the embeddedness of the economy within a social matrix among egalitarian or tribal societies. He wrote that "social phenomena were not discrete; each phenomenon contains all threads of which the social fabric is composed" (Mauss 1970: 1). This relates closely with the lattice or net metaphor employed by Walter and Green (2011) (see Figure 2.3), and has been repeatedly highlighted in ethnographic research in

Solomon Islands and wider Melanesia (e.g. Thurnwald 1934; Firth 1950; Ross 1978; Thomas 1991; also see Sheppard 2019c).

Examining the nature of trade and exchange in prehistory has traditionally entailed an investigation into understanding the various modes under which exchange was practised. Polanyi (1957) put forward three main structures under which economic systems could be grouped: reciprocity, redistribution and market exchange. “Reciprocity”, he wrote, “denotes movements between correlative points of symmetrical groupings; redistribution designates appropriational movements toward a centre and out of it again; exchange refers here to vice-versa movements taking place as between “hands” under a [price-making] market system” (Polanyi 1957: 250). Renfrew (1975) described ten modes of trade that could be interpreted spatially by examining the distribution and flow of artefacts (Figure 2.4).

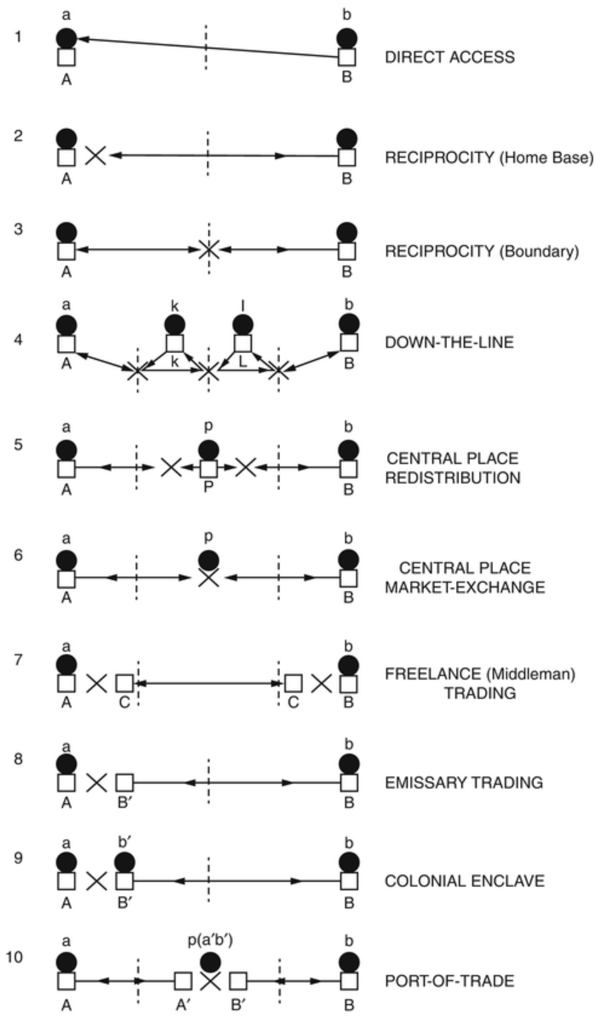


Figure 2.4 Modes of trade from Renfrew (1975: 42). Circles a and b indicate respectively the point of origin and the place of receipt of the commodity, squares A and B the person at the source and the recipient. Circle p is a central place, squre P a central person. Exchange transactions are indicated by a cross, and territorial boundaries by a broken line.

Examples of all of these modes, I argue, can be interpreted from ethnographic and historic accounts of trade and exchange practices in the Western Solomons. For archaeological study of the region's prehistory, however, I wish to place emphasis on the first seven modes and simplify them into five categories: direct access, reciprocity (consisting of 'home base reciprocity' and 'boundary reciprocity'), down-the-line, middleman trading and redistribution (comprising 'central place redistribution' and 'central place market-exchange').

Direct access, as its name implies, requires no exchange transaction. Reciprocal exchanges take place either at the home of the communities or at a common boundary between them. Down-the-line involves products moving across multiple communities or territories through successive exchanges. Middleman trading requires an autonomous trade partner negotiating and facilitating exchanges between communities. Lastly, redistribution involves inter-communal exchanges occurring either with an actively participating central place or an inactive one whose territory is used a meeting point or marketplace. Differentiating between these modes of exchange can be very difficult, if not impossible, from an examination of the archaeological record. However, as Renfrew (1975: 41) has argued, they provide a useful heuristic toolset to make interpretations about the nature of interaction that took place in the past as well as how exchange systems may have been organised. Combining archaeological evidence with historical and ethnographic data, I argue, can contribute even greater insight into the structure and socio-economic nature of prehistoric exchange systems.

Investigating how prehistoric economies were structured and organised also requires an understanding of the scale at which items were produced and exchanged in the past. By this, I am referring primarily to the level of organisation of production as well as the spatial extent of the distribution of trade goods (Costin 1991; Tite 1999). Craft specialisation is of considerable interest here, and particularly for the study of production and exchange of trade goods in Solomon Islands and wider Melanesia. This is partly because of the implications craft specialisation has for the production of surpluses for exchange, and, ultimately, for learning about the growth of complex forms of socio-political organisation. Varying levels of production seen in pottery manufacture have been well-studied by archaeologists (Rice 1984, 1991; see Santacreu 2014 for a comprehensive overview). Santacreu (2014: 251) has written that craft specialisation can be defined by two key elements. The first is an intensity and level of production exceeding the needs of the potters and their households, and the second is the use of the vessels by individuals who are not involved in the manufacturing process but have access to the products by means of diverse exchange relations. Consumers, who usually do not belong to the same household as the producers, Santacreu has argued, also play a key role in the development of specialised production.

Archaeological evidence used to reconstruct the organisation of production, Tite (1999) has stated, can be either direct or indirect. The first refers to the excavation of pottery production workshops and associated raw materials and toolkits, while the second concerns sherds or traces of the finished products. In the latter situation, which is most often encountered in the Western Solomons, Tite has highlighted that the factors that need to be considered are the degree of standardization, the labour or skill requirements and level of technology, and the pattern of distribution (1999: 191). Pottery assemblages which demonstrate a high degree of standardization or homogeneity regarding the materials, techniques, fabrics and vessel shapes used in their manufacture are generally assumed to reflect specialised mass production. Whereas heterogenous ceramic assemblages with a high variability are usually indicative of household production. Evidence of craft specialisation and general patterns of pottery production and manufacture in Manning Strait are discussed later in Chapters 7 and 10.

Melanesia has been portrayed as an exceptional case study for learning about prehistoric economies, particularly reciprocal exchange systems, for over a century. Bellwood (1978) and others (Allen 1985) have put forward several reasons as to why Melanesian trade is distinctive. One, Melanesian societies are often specialised in terms of production (e.g. Specht 1974). For a local group to acquire all its necessities it may be frequently required to engage in trade with another group whom they may share no kin-based relations. Trading, in this sense, is carried out almost purely as a matter of subsistence. Two, Melanesian trade can be in many ways an individual activity or partnership, and commonly takes the form of immediate or delayed exchange between two partners or friends from different communities (Sahlins 1965). This can be contrasted, for example, to systems of collection and redistribution centred on a chiefly personage which are more commonly seen in Polynesia. Third, market price mechanisms such as supply and demand usually play a very minor or sometimes non-existent role in affecting how Melanesian exchange systems change or evolve. More weight has instead been placed on socio-political factors such as warfare, marriage alliances, the monopolising and maintenance of trade partnerships, and the general conservatism of egalitarian socio-political organisation (Allen 1985: 51).

Archaeological studies of Melanesian exchange systems have demonstrated that over the last few millennia there is evidence of gradual or episodic constrictions in the geographic scale of exchange networks, accompanied by subsequent increases in the intensity of exchange within these progressively smaller systems (Kirch 1991). This has been argued for the Mussau Islands (Hunt 1989; Kirch 1987), numerous places along the northern Papuan coast such as the Vitiaz Strait and Madang (Irwin 1978) and the Massim region (Egloff 1978). Additionally, in Solomon Islands, a similar trend has been described for the New Georgia group (Thomas 2009) and the Reef/Santa Cruz Islands (Green 1987). One of the first archaeologists to take note of this trend and describe it in detail was Jim Allen (1984). Following an archaeological study of 'subsistence trading' among the Western Motu on the southern Papuan coast, Allen (1984: 456) proposed a model on the evolutionary development of Melanesian trading systems, arguing that they "could be predicted to become spatially smaller, trading to become more intense, and specialized trade items to become more diversified" (Figure 2.5).

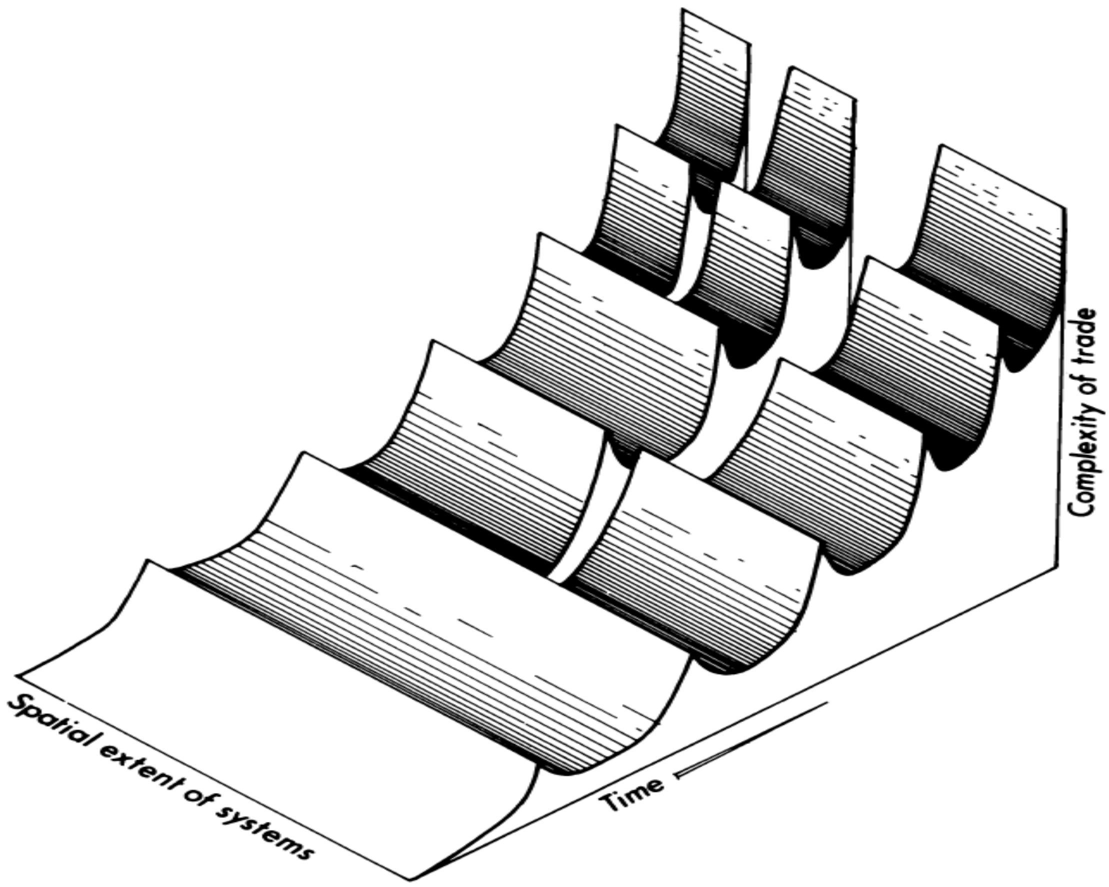


Figure 2.5 Allen's (1984) model of changing exchange network configurations.

A second component of Allen's model was that eventually "trade complexity might begin to yo-yo around a mean… if social mechanisms become more rigid"; or it may diminish if an ecological imbalance of some sort sets in such as the disappearance through over-exploitation of satisfactory canoe trees (*Ibid*). He made explicit that the model carries with it no implication of any predetermined trajectory. Its purpose, Allen explained, "is intended to be explanatory in a different way, in that [it] focus[es] on the cultural variability of the coastal Melanesian past" (Allen 1985: 52). In Chapter 10, this model is tested against findings made from this study.

2.3.3 Scapes: Landscapes, Seascapes and Islandscapes

Island archaeology is also partly rooted in the emergence of archaeological approaches to landscape and the study of settlement patterns which rose in popularity in the 1950s to '70s. Gordon Willey's (1953b) study of Viru Valley in Peru, in which he surveyed 350 sq. km using aerial photos and drawings to map and document 315 sites, was foundational and helped spark an explosion of research into this field of study. In addition to Mesoamerica, other hotspots for landscape studies during these decades included Mesopotamia (Blanton 1978; Coe 1967) and China (Chang 1958, 1963). The terms 'settlement' and 'settlement patterns' used in this study denote similar definitions employed by Willey (1953b: 1). The latter term refers to the way people organised themselves over a landscape on which they lived, and concerns sites of inhabitation, their arrangement, and the nature and disposition of structures pertaining to community life.

Landscape archaeology, defined basically as the study of the ways in which people in the past constructed and used the environment around them (David and Thomas 2008: 38), has developed as both a technique and, in more recent decades following the rise of post-processualism and post-modernism, as a theoretical construct (Gosden and Head 1994). Examining archaeological evidence of settlement patterns and experiencing a landscape phenomenologically are few of examples of techniques used in landscape archaeology (Tilley 2008). In relation to theoretical and social aspects of the approach, 'cultural landscapes' or 'place' are seen to mean different things for different people and thus its complexity necessitates exploring (Layton and Ucko 1999). An important attribute of a cultural landscape approach, which aligns closely with a push for the decentring of land in island archaeology, is its treatment of places and spaces as dynamic participants in past behaviour and not merely as settings or artefacts of human action (Branton 2009).

'Seascapes', in a similar manner, can be considered both physical and conceptual (Cooney 2004; see other papers in 2004 special issue of *World Archaeology*). McKinnon *et al*. (2014) describe a 'seascape approach' as an investigation of the sea as a fluid entity which extends across time and space. This approach arose in the early 1990s following a movement away from development-in-isolation models towards the decentring of land in favour of an emphasis on the archaeology of the sea and maritime societies (Gosden and Pavlides 1994; Broodbank 2000; Rainbird 1999, 2007). A similar reconceptualization has been applied to other 'scapes' such as 'islandscapes' (Broodbank 2000: 21-22) and 'spiritscapes' (David and Thomas 2008). An underlying component of the study of these 'scapes' has been a pursuit to expand upon the study of spaces not just as insular units of analysis but to recognise and understand them and their surrounding environment as spatially and socially interlinked networks (e.g. Sheppard and Walter 2008).

One of the first anthropological studies in the Pacific to employ the term 'seascape' was Gosden and Pavlides' (1994) article *Are Islands Insular? Landscape vs seascape in the case of the Arawe Islands, Papua New Guinea*. Using ethnohistorical data on settlement, subsistence and trade practices in the Arawes, they challenged the effectiveness of the development-in-isolation model for examining Pacific prehistory. As opposed to emphasising the impact of insularity on culture change and settlement use, they argued that sea links were paramount. More broadly, they contended that connectivity by sea was a "key feature of all periods of Pacific prehistory… and that in the process of colonisation, not only were particular sailing strategies employed but also social strategies designed to connect up large regions" (Gosden and Pavlides 1994: 162). Channelling Hau'ofa's (1993) powerful reconceptualization of Pacific Islands, most archaeologists today recognise the importance of studying and recognising Oceania not as dots within a sea but as interconnected networks of people with shared histories, ancestries, cultural traditions and beliefs.

Contested landscapes are another important form of a 'scape' in archaeology. Anthropologist and key author on the subject, Barbara Bender (1992: 735), wrote that "people engage and re-engage, appropriate and contest them (landscapes), use them to create and dispute a sense of identity – whether of self, group or nation". Once a broadened view of landscape such as this has been adopted, she argued, it becomes clear that “landscapes are always in process, potentially conflicted, untidy and uneasy” (Bender 2001: 3). The term ‘contested landscapes’ has most often been used by social anthropologists to explore ownership over space, what that ownership entails and how contemporary peoples’ interactions with landscapes are in constant flux. In some of these instances, archaeological structures and the role they have played in influencing contemporary contestations over landscapes have been investigated (Humphrey 2001). In the study of prehistory, archaeologists have described landscapes as contested usually in a more literal sense, relating to competition over resources and inter-group conflict. Some archaeologists, however, have applied the more holistic cultural landscape definition of ‘contested landscapes’ in investigations of warfare and piracy (Hitchcock and Maeir 2018) as well as political volatility which can result sometimes in the ‘clearance of landscapes’ (Smith and Gazin-Schwartz 2008). The latter notion refers to how landscapes can become artefacts of contestation when peoples are removed from or abandon their homelands.

An important quality of a landscape approach, as the various ‘scapes’ discussed above have demonstrated, is its broad applicability to understanding cultural processes. In addition to providing value for archaeological study of the Western Solomons, it is argued here that a landscape approach which questions whose history is being researched and how this can impact upon land claims is relevant and valuable for communities living there today. Logging and other development schemes continue to arise in Solomon Islands and are having devastating repercussions for the protection of ancestral shrines, burial grounds and other cultural landmarks. This is problematic as these physical landmarks, as well as their intangible histories and heritage, are integral to both indigenous peoples’ ancestral connections to their landscapes and customary laws practised in most provinces in the Solomons surrounding entitlement to land.

In addition to warfare and other contestation which was capable of creating social divisions between groups in the past, communities may have also found difference or shared commonalities in engaging in spiritscapes. This is particularly relevant for this investigation of the Western Solomons where during the emergence and practice of head-hunting, much of daily life was influenced by and revolved around spirituality (Thomas *et al.* 2001; Walter *et al.* 2004). This was invigorated by the construction of, and offerings made to, shrines as well as other activities such as raiding and inter-island exchange which were practised throughout the region.

2.4 Western Solomons: Regional Studies of Interaction and Sequence Building

Having laid out theoretical foundations of culture history and biogeographic and social modelling utilised in island archaeology, regional studies of interaction and sequence building from the Western Solomons can be reviewed in closer detail. Research carried out on ceramics, collected mainly in the New Georgia group, have contributed significantly to constructing a cultural sequence for the Western Solomons and understanding the development of prehistoric mobility and interaction in the region. As most of these ceramics derive from intertidal late Lapita deposits, attention has been placed primarily on improving our understanding about the development of spheres of interaction that occurred early in prehistory. In the last millennium, where our knowledge of the ceramic record in the Western Solomons is lacking, biogeographic modelling advocated namely by Terrell has been particularly effective in exploring and explaining the regionalisation of interaction networks that developed at this time. These lines of research are examined further here, and in Chapter 10 they are drawn upon to contextualise the new results presented in this study in response to addressing the research aims and questions set out in Chapter 1.

To date, only one ceramic sequence has been constructed for the Western Solomons using decorated pottery collected from intertidal sites in Roviana and from other inland sites on New Georgia (Sheppard *et al.* 1999; Felgate 2003, 2007). Felgate describes the sequence, which is formed of four styles – Honiavasa (3000-2800 BP), Miho (~2800-2500 BP), Gharanga and Kopo (~2500-2000 BP) (Figure 2.6), comprehensively in his doctoral thesis and expands upon the dating of Honiavasa in a later publication (Felgate 2007). Honiavasa pottery is characterised by instances of dentate-stamping, applique, incision and complex carinated vessel forms, and is likely to be comparable in age to Poitete on Kolombangara where a few coarsely dentate-stamped have also been found (Summerhayes and Scales 2005). Miho pottery is characterised by incision, applique, fingernail impression and perforation, and Gharanga/Kopo pottery are distinguished by horizontal bands of punctation located on the neck and/or multiple bands of opposed fingernail impression on the shoulder of the vessels.

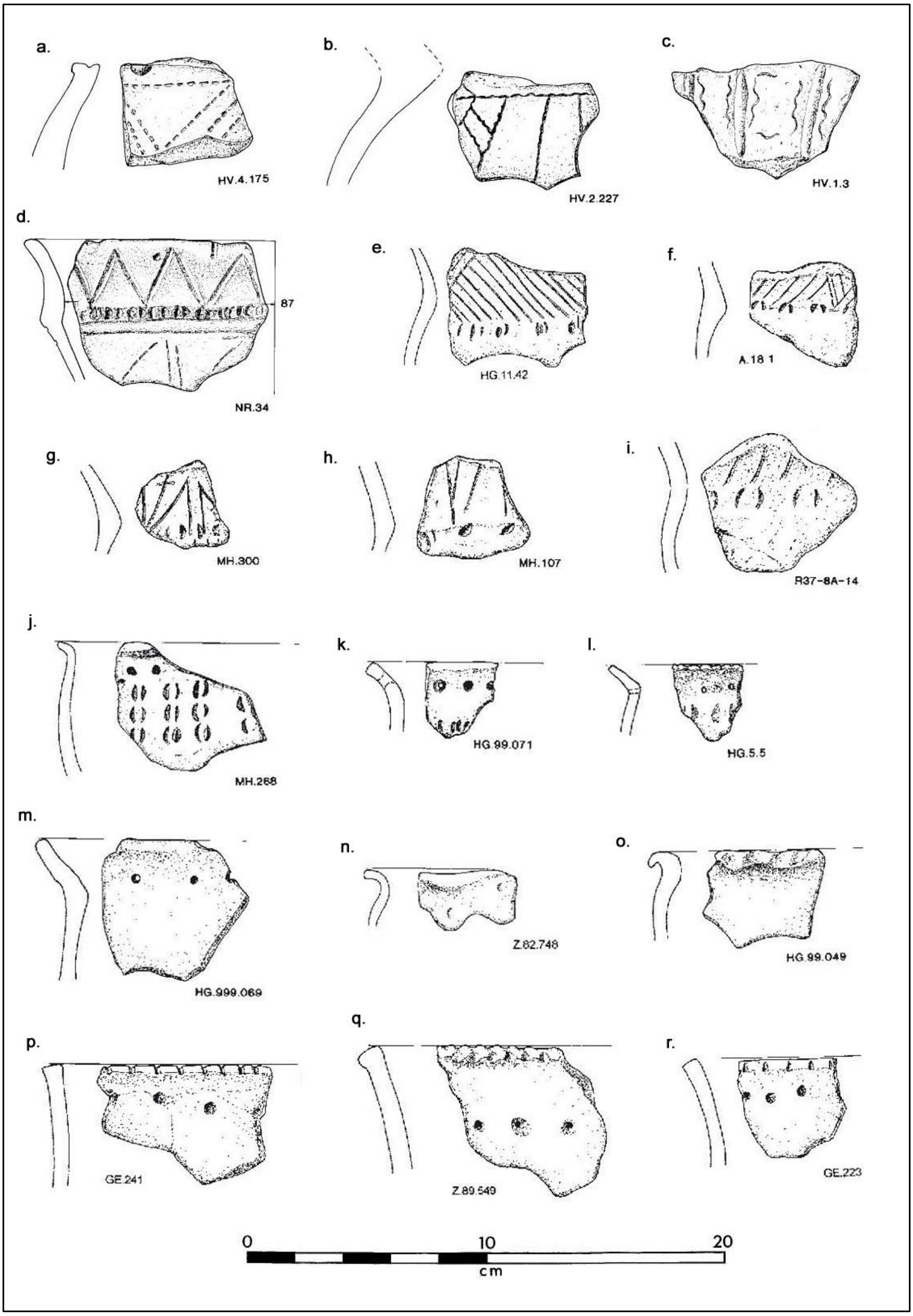


Figure 2.6 Roviana late Lapita ceramic sequence. Honiavasa style: a-d; Miho style: e-i; Gharanga style: j-o; Kopo style: p-r. (Created by Wu 2016: Fig. 218 from Felgate 2003: Figs. 45 and 49, Felgate 2007: Figs. 3-5).

The chronology of this sequence has been based principally on seriative exercises using decorative and other ceramic attributes, and as was touched on in Chapter 1 an absence of stratified deposits associated with intertidal sites in the New Georgia group has made assigning reliable dates to each style difficult. The dates listed above in association with the styles are based on Felgate's (2007: 135) estimation of the age of Honiavasa and his seriation of the Miho and Gharanga/Kopo styles (see Felgate 2003: Chapters 12 and 13 for a more comprehensive discussion on chronology). Overall, the ceramic sequence and research carried out by Felgate, Sheppard, Walter and others (Summerhayes and Scales 2005) on pottery collected in the New Georgia group have made significant contributions to understanding the nature and timing of the prehistoric settlement and long-term cultural change in the Western Solomons. However, the lack of confidence that remains concerning the radiocarbon ages of the Roviana pottery styles is an issue as chronology forms an essential building block of any culture historical investigation. Therefore, an important contribution that this study aimed to make was to provide higher resolution in the dating of pottery styles in the Western Solomons and to provide a more complete picture of the development of pottery traditions in the region subsequent to the late Lapita period.

Most of our knowledge concerning prehistoric mobility and the development of networks of interaction in the Western Solomons during the late to immediate post-Lapita periods has been gained from studies employing geochemical and petrographic analyses on ceramics (Buhring 2011, *et al.* 2014; Felgate and Dickinson 2001; Ramezanian-Abhari 2004; Findlater *et al.* 2009; Azémard 2011; Tochilin *et al.* 2012). This research has shown that most communities inhabiting intertidal sites in the New Georgia group during the late Lapita period made their own pottery. Additionally, they were engaged in both regional and long-distance networks of exchange mainly within the archipelago as well as much further afield across the Solomon Sea. In the last millennium, most of these studies have demonstrated that these exchange networks contracted and interaction spheres become more regionalised, mirroring a historical trend seen mainly in coastal Papua New Guinea (Lilley 1988; Allen 1984) and which has been argued for most of Island Melanesia (Kirch 1991).

This pattern is exemplified by research carried out on assemblages from the New Georgia/Roviana area and Vella Lavella by Karolyn Buhring (2011, *et al*. 2014). She employed portable x-ray fluorescence (pXRF) and scanning electron microscope (SEM) analyses to assess the transfer patterns of 256 sherds from nine archaeological sites in the area which comprised 'early period' (2700-2000 calBP) intertidal sites and 'late period' (800-100 calBP) terrestrial sites. Her results demonstrated that ceramic production was present at multiple locations during the early ceramic period and that pots were transferred at different geographical scales involving long-distance interactions (Figure 2.7). Whereas, during the 'late period', pottery-making was characterised by a more restricted occurrence and "transfer networks… receded and became exclusively regional" (Buhring 2011: ii). As is depicted by Figure 2.7, her results indicated that all 'late period' pottery found in the New Georgia group was most likely to have been imported from Choiseul.

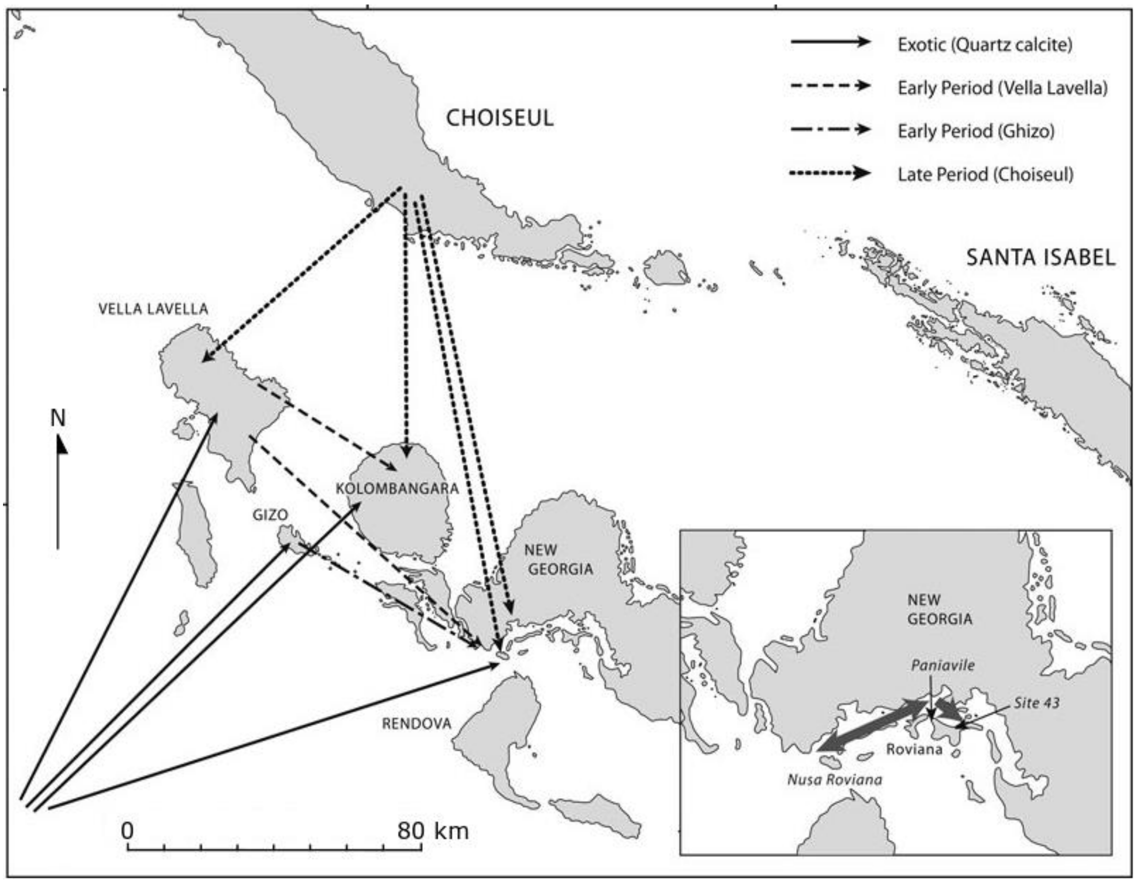


Figure 2.7 Map showing prehistoric transfer patterns of pottery found in the New Georgia group (figure from Buhring et al. 2014: Fig. 8).

Other researchers that have argued a similar pattern in the late Lapita period of multiple pottery production centres being in operation in the New Georgia group and trading occurring between them include Felgate and Dickinson (2001) and Findlater *et al*. (2009). Findlater and authors combined petrography and geochemical analysis using an energy dispersive spectrometer (EDS) to examine the fabrics and clay composition of 26 sherds from the sites of Poitete and Tanahuka located on

Kolombangara. From their analysis, they detected a complexity in the combinations of clays and fabrics which was indicative of models of mobility for the makers of the pottery. They also identified a quartz-calcite fabric which was distinctive from the rest of the local fabrics and that had originally been identified by Felgate and Dickinson (2001) to be geologically exotic to Solomon Islands. Felgate and Dickinson (2001) proposed that the fabric was likely to have been transferred from an unknown source across the Solomon Sea/Gulf of Papua. Further analysis, however, specifically U-Pb dating of detrital zircons, carried out on this anomalous fabric has traced it to Muyuw Island located in the Louisiade Archipelago (Tochilin *et al.* 2012).

Evidence for a pattern of trans-Solomon Sea interaction occurring during the late Lapita period has been reviewed comprehensively in Sheppard *et al.* 2015. In the article, the authors highlighted other pieces of evidence that supported interaction across the Solomon Sea, most notably the petrographic characterisation of a sherd found on Bellona that was dated to about 2000 BP to Roviana (Dickinson 2006: 115). Ultimately, however, the authors concluded that "the amount of interaction across the Solomon Sea was not sufficient enough to alter in any visible way the established dominant north-south cultural patterns which were most probably established during the third millennium BP as the result of movement of people and ideas associated with the Lapita cultural tradition south along both the coast of Papua and down the Solomon Islands chain" (Sheppard *et al.* 2015: 77). The duration of the Solomon Sea interaction sphere remains speculative, although the authors suggested that it is possible ceramic transfer continued for over 500 years during the late Lapita period (*Ibid*: 71). Furthermore, the dissolution of this long-distance network, they raised, is likely to have coincided with the end of the intertidal ceramic sequence in the New Georgia group which appears to have occurred around 2000 BP. Not a great deal is known about the transformation of pottery exchange networks in the Western Solomons after this period due mainly to a lack of securely dated post-Lapita deposits and ceramic assemblages recovered in the region. Therefore, an important objective of this study was to address this.

Terrell's (1976, 1977ab, 1986) research on Bougainville has provided insight into processes of culture change that developed in late prehistory in the Northern and Western Solomons. Drawing upon island biogeography (MacArthur and Wilson 1967) and ecological studies carried out on bird and other animal biodiversity and population distribution in Island Melanesia (Mayr 1969; Greenslade 1969; Diamond and Mayr 1976), Terrell has demonstrated the usefulness of applying biogeographic modelling to the study of cultural and linguistic diversity in Solomon Islands. Specifically, his nearest-neighbour analysis (Figure 2.8), which he created to "attempt to see what kinds of interaction patterns should be expected among the Solomon Islands if measures as fundamental as distance and area strongly predict the spatial movements of the islanders" (1977a: 36), has proven to be particularly effective at modelling the formation and extent of inter-island interaction that developed in Solomon Islands in the last millennium (c.f. Walter and Sheppard 2017: 16-20).

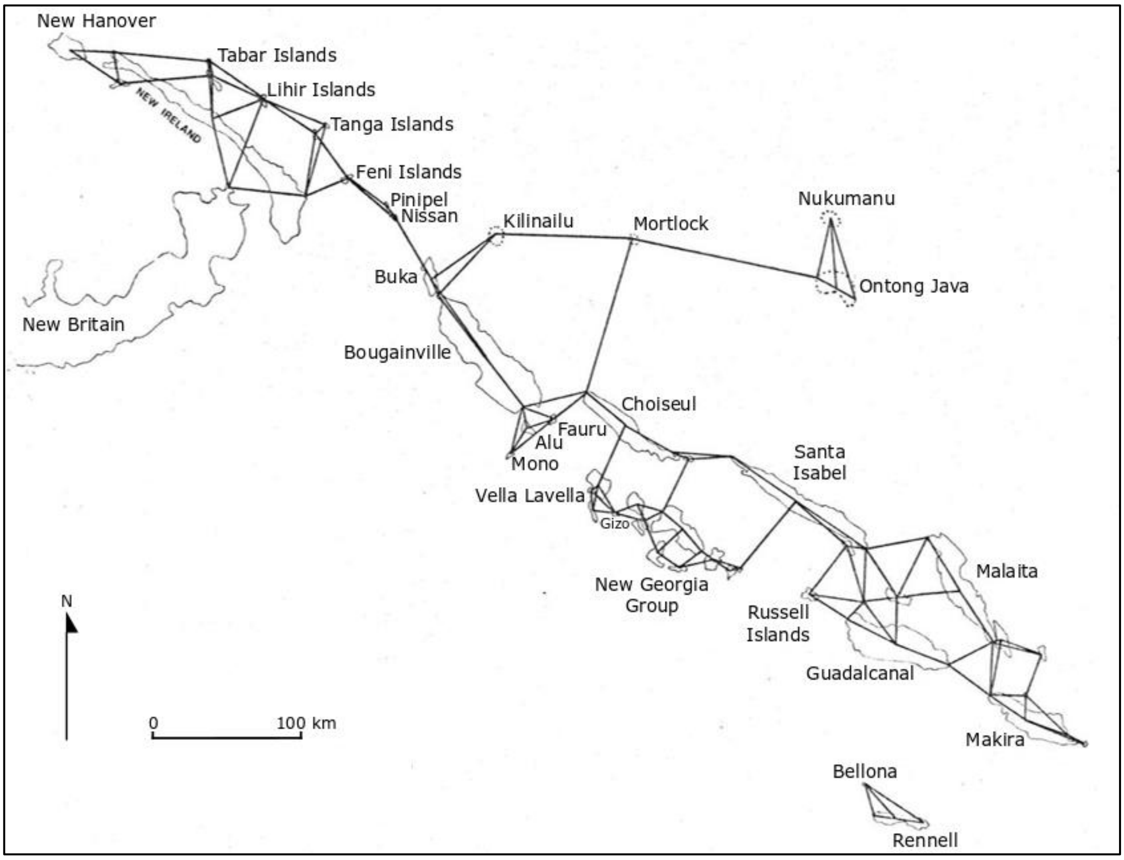


Figure 2.8 Nearest-neighbour model in Solomon Islands (from Terrell 1976a: Fig. 6).

In the model, the lines dictate the shortest distances between islands, and small islands are represented by single points while larger islands are defined by three points: a mid-point and two end-points located at the farthest extremes of the island. The figure "portrays schematically the most probable directions of inter-island trade, travel, inter-marriage and the like" (Terrell 1977a: 37), and due to the elongated, linear nature of the Solomons archipelago, it predicts the highest points of interaction to be between the ends of the islands such as Bougainville Strait, Manning Strait and the southern tip of Isabel. Importantly, it is at these junctures where there is abundant linguistic, archaeological and ethnographic evidence that supports extensive interaction was occurring between local communities which began intensifying in late prehistory. This is explored further in Chapter 4 where Terrell's model is compared against ethnographic evidence of prehistoric settlement and exchange patterns recorded from Choiseul, Isabel and the wider Western and Northern Solomons. Specifically, the model is integrated into a discussion about cultural interaction in late prehistory and the development of three spheres of interaction involving the Northern, Western and Central Solomons.

2.5 Conclusion

This chapter has demonstrated that there are a multitude of ways archaeologists can approach the study of straits and island societies who inhabited them in the past. From archaeological study of the Pacific, three case studies have been given and the approaches taken in them are drawn upon to form part of the foundation of the theoretical and interpretive framework utilised in this study. These case studies included Lilley's (1987) culture historical investigation of the prehistoric development of exchange systems in Vitiaz Strait, McNiven's (2006, 2015) seascape approach to Torres Strait, and Irwin's (1972) more ecologically and spatially oriented examination of Bougainville Strait. These examples were chosen not only to exhibit the diverse ways in which these marine environments have been examined and conceptualised, but also with the intention to make cultural and temporal parallels with this investigation of the prehistory of Manning Strait. Specifically, this is in relation to establishing an understanding of the nature and sequence of prehistoric settlement, the development of networks of interaction in the region, and the impact of these phenomena on processes of culture change. Two bodies of theory were highly influential to the research design and methodologies of these case studies, and these have been tailored to form the theoretical and interpretive framework of this study. These are culture history and island archaeology, the latter placing emphasis on seascapes and inter-island interaction.

In the section on culture history, it was demonstrated how the paradigm played a foundational role in the development of archaeological practice in the first half of the twentieth century. Key weaknesses of the approach, which were discussed, included the susceptibility culture historians can have in misconstruing typological creation with empirical reality as well as failing to take into account analogous from homologous differences. In contrast, a valuable strength of culture history is the emphasis that is placed on establishing a sound understanding of the spatial, temporal and other elementary aspects of cultural variation that may be visible in the archaeological record. This is particularly useful for when carrying out archaeological research in a new region where this information is often seen as a prerequisite to addressing more complex questions about human prehistory. When building upon or continuing culture historical research in a region, it was argued that adding to or challenging cultural types and classifications can contribute towards the accumulative credibility of these archaeological sequences. Ultimately, it was argued that a culture historical approach can be further strengthened by incorporating culture ecological and social factors as is done effectively in archaeological study of islands and cultural landscapes.

Much of archaeological research in Solomon Islands has been culture historical, and for some of the first major studies in the region, culture area models have proved to be an effective approach to exploring cultural origins and change over time. This is exemplified by Mead's (1973) study of the Star Harbour region of east Makira which he entitled the Eastern Triangle culture area, and Green and Walter's (2011) monograph on the village of Su'ena located on Uki Island off the northern coast of Makira. In contrast to more grandeur and static uses of the culture area model which characterised works by Wissler and other early culture historians, Mead, Green and Walter's revised use of the concept is more adept in encompassing the temporally and socially dynamic nature of culture. In addition, an important quality of Green and Walter's model was the emphasis they placed on incorporating ethnography and oral tradition in their culture historical reconstructions. Their revised version of the model approaches the meaning and almost captures the essence of 'communities of practice'.

An important distinction between culture areas and communities of practice is that the former treats cultures in a primarily spatial manner while the latter perceives community-building as a social process with no physical parameters. To reiterate Thomas (2009: 141), he rightly cautioned that classifying a people or region as a culture area can obscure our understanding of processes giving rise to diversity and can neglect gaining a better understanding of the particular nature of practices that were shared. Nonetheless, I agree with Knappett (2011) in contending that the physical spatial component which the culture area model advocates cannot be completely forgotten in archaeological examinations of communities of practice. A networks approach, as advocated by Knappet (2011: 57-58), is employed in this study with the intention to maintaining a balance in recognising both spatial and relational aspects of cultural development in Western Solomons' prehistory as well as to examine closely the various scales and forms of interaction that may have occurred in Manning Strait.

In the section on island archaeology, concepts that are central to the archaeological sub-discipline and the way they are drawn upon in this study were discussed. Isolation and interaction are regarded in this study as relative states that form a continuum ranging from complete isolation at one end of the spectrum to frequent and uninhibited interaction on the other (e.g. see Broodbank 2008; Erlandson 2008). Where island societies fall on this spectrum can vary through time and space, and the degree to which they isolate themselves or interact with others is influenced by multiple cultural and environmental factors operating on many different scales. An exceptional example of a possibly totally isolated island society is Polynesian settlers on Easter Island whose isolation may have lasted five centuries before contact was made with Europeans (Hunt and Lipo 2008).

Most archaeological models on interaction and isolation can be divided between two bodies of thought. The first favours biological evolutionary modelling and human biogeography to model cultural change (e.g. Terrell 1976, 1977ab) while the second treats island populations not as distinct 'units of analyses' but as interconnected nodes that together form an islandscape. The theoretical framework employed in this study aligns more closely with the latter group. However, recognition is still given to the important roles biogeographical and environmental factors play in influencing subsistence practices, settlement and mobility patterns and processes of cultural diversification. In a similar manner to how islands have been examined in island biogeography, it is recognised that straits possess two innate qualities or attributes which make them valuable for the study of these processes. One, they separate land and connect bodies of water that are otherwise separate. Two, they are usually narrow and navigable unless too shallow or disrupted by a reef. Recognising possible impacts of physical barriers or other ecological restrictions on human populations in the past is considered an important part of this archaeological investigation. There is a danger, however, in this process of overlooking the agency of the prehistoric communities themselves and the impact of social barriers on inter-communal interaction.

A seascape or cultural landscape approach is seen as a constructive method to avoiding environmental determinism. Such an approach taken in this study places emphasis on recognising and treating 'scapes' not just as insular units of analysis but to recognise and understand them and their surrounding environment as spatially and socially interlinked networks. Landscapes, in this sense, are both social and physical, and can play an active role as dynamic participants in influencing past human behaviour. They are also in constant flux and are continuously contested over meaning, ownership and value placed on the landscapes by different peoples. Barriers, and acknowledging the agency of maritime communities in successfully navigating between them as well as their ability to create barriers to intercommunal engagements, are also seen as an integral part of this approach.

The opposing outlooks of formalist and substantivist approaches to studying prehistoric economies were discussed. It was argued from this that a balanced outlook which draws upon both bodies of thought provides an effective approach. This is particularly the case for the study of Melanesian exchange systems where island biogeography and environmental parameters can play a crucial part in influencing the production and exchange of foods and other goods between communities. Additionally, trade relations in Melanesia are widely recognised for being equally or sometimes more greatly impacted by socio-political parameters and the organisation of exchange networks. An important historical trend that has been repeatedly described in Melanesian prehistory was also discussed. First described and modelled by Allen (1984), the trend is characterised by a progressive regionalisation or reduction in the geographic scale of exchange networks and a gradual increase in intensity and craft specialisation. Allen's model, which has found to be supported in archaeological studies across many parts of Island Melanesia (Green 1987; Hunt 1989; Kirch 1987, 1991; Thomas 2009), is tested against findings from this study. In Chapter 10, it is compared specifically against patterns of pottery production and exchange dated to within the last millennium in Manning Strait as well as wider patterns evident from the late Lapita period onwards in the Western Solomons.

A critical review was also given of regional studies of cultural interaction and sequence building that have been carried out in the Western Solomons. It was highlighted that Felgate's (2003, 2007) ceramic sequence and other studies carried out on intertidal pottery found in the New Georgia group have provided a crucial foundation to understanding the prehistoric settlement of the Western Solomons and processes of long-term culture change. Important limitations of this sequence were also raised and these concerned a lack of securely dated ceramic deposits associated with the pottery styles and its almost exclusive focus on ceramics made during the late Lapita period. In the last millennium, a period in which our understanding of the ceramic record in the Western Solomons is poor, it was argued that Terrell's (1976, 1977ab) nearest-neighbour analysis provides a particularly effective approach to modelling the geographic extent and transformation of networks of interaction that developed during this time. This is expanded upon in a review of ethnographic research in Chapter 4 where the model is applied to a review of the spatial distribution of cultural traditions, such as shrine and burial practices, in the Western Solomons. Before proceeding to review the ethnographic and historical literature, however, it is important to first provide further context of the physical environment and populations under examination.

Chapter 3 The Environment and the People

This chapter provides an overview of the physical environment of the study region and of the population distribution and history of Solomon Islanders as indicated from linguistic and genetic research. Special attention is given in these overviews to the Western Solomons, particularly Choiseul and Isabel. The chapter is divided into three sections. The first describes climatic, geographic and other physical characteristics of the study region and provides an overview of native flora and fauna. Emphasis is placed in the description of the region's plant and animal biodiversity on highlighting species commonly exploited in traditional subsistence economies of Solomon Islanders. The second section outlines the distribution of populations and languages in Solomon Islands as well as a review of genetic research carried out in the region. The chapter is concluded with a synthesis of the physical geographic information with findings made from linguistic and genetic research to briefly discuss prehistoric colonisation and mobility patterns in the Western Solomons.

3.1 Natural Environment

Solomon Islands is one of the most biodiverse and resource-rich environments among the lowly populated countries of Oceania. This has been shaped significantly by its location, lying west of the boundary between Near and Remote Oceania as well as the Andesite Line (Figure 3.1). In addition to being a profoundly important geographic and historical barrier in Pacific prehistory, the boundary between Near and Remote Oceania demarcates a pivotal ecological and biological divide. Island regions located west of the boundary in Island Southeast Asia are characterised by a remarkable richness in biodiversity. Whereas, travelling east of New Guinea to the Solomons and further into the remote Pacific, this richness decreases markedly. For example, the Solomons are home to about 2800 angiosperm species whereas over 9000 have been identified in Papua New Guinea (Hancock and Henderson 1988: 9).

This strong contrast in biodiversity of island environments in Near and Remote Oceania is akin to a geological contrast represented by the Andesite Line. The boundary parallels deep oceanic trenches located between the Pacific and Australian Plates, and distinguishes larger and more chemically variable continental landmasses of the western Pacific from the geologically younger and less diverse coral atoll and volcanic islands of Remote Oceania. Islands located west of the boundary, which are grouped as

Non-Oceanic islands, are characterised primarily by felsic andesitic volcanic rock. Whereas Samoa, Cook Islands and other smaller Oceanic Islands located east of the line are characterised by mafic basaltic volcanic rocks. The rest of this section expands upon the climate, physical geography and biodiversity of Solomon Islands with special attention given to the Manning Strait region.

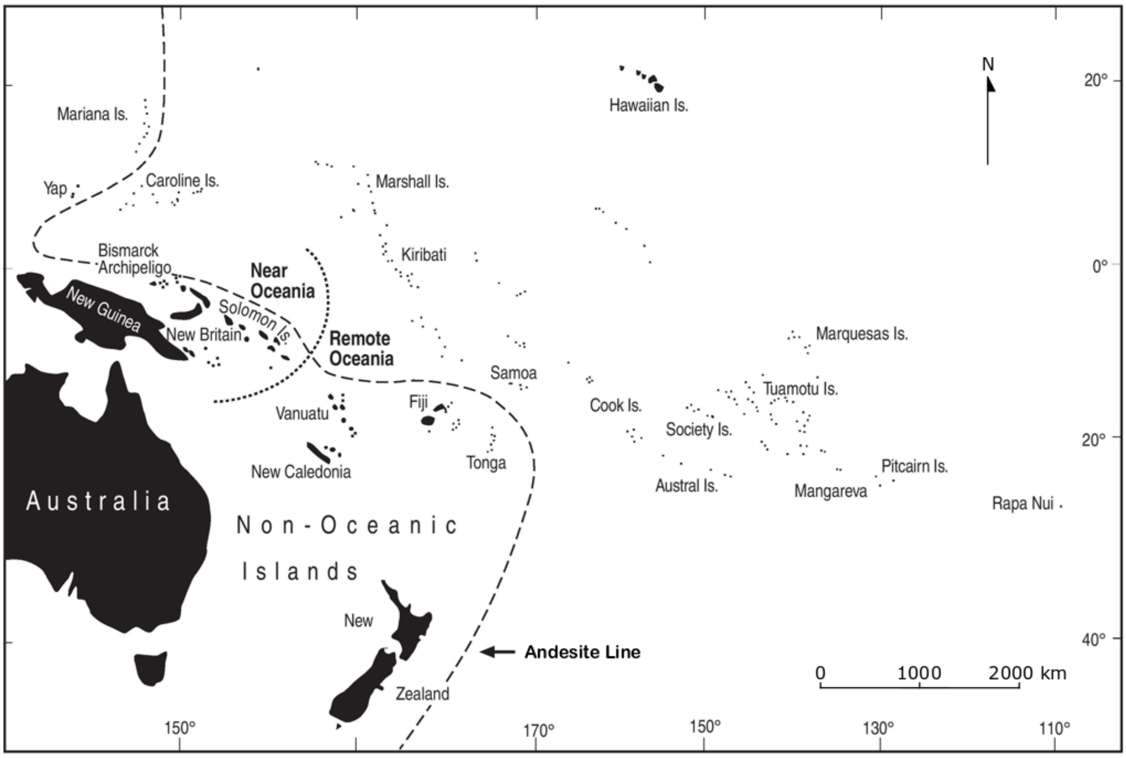


Figure 3.1 Map of the southwest Pacific showing Near and Remote Oceania boundary and the Andesite Line.

3.1.1 Weather Patterns and the Sea

Solomon Islands lies within the humid tropical maritime zone and is characterised by consistent temperatures throughout the year ranging between 28-32 degrees Celsius. Annually, Solomon Islands receives a considerable amount of rainfall averaging between 3000-3500 mm. There are two seasons during the year which change in synchronisation with climatic and wind patterns of the South Pacific Ocean. The dry and cool season takes place from April to October, around the time of the southern winter, during which the dominant south easterly trade winds blow (Figure 3.2). The strength and duration of these prevailing winds vary from year to year. More monsoonal weather takes shape from November to March in the wet and warm season. During this period, north westerly winds carry warmer air into the region, resulting in higher temperatures, more rainfall and a greater tendency for cyclones to form. Cyclones occur frequently in this part of the Pacific. For example, an average of 29 cyclones developed within or crossed Solomon Islands between the 1969/70 to 2010/11 seasons (PCCSP 2014: 260).

Waves within the Solomons interior, which are sheltered from easterly trade winds by the island chain, do not vary considerably throughout the year but do display strong seasonal variability of direction triggered by trade winds and cyclones. Waves are generally small in Honiara, for example, which have a mean height of 0.15 m. Although they can rise to become larger than 0.8 m during December to March as the wet and cyclone season progresses (PCCSP 2014: 261). Little meteorological data is available for southeast Choiseul and northwest Isabel. Given the northern edges of these regions fall outside the protection of the island chain, however, wave exposure and fluctuation in height is likely to be considerable which is problematic for the preservation of coastal archaeological sites. An assessment carried out by Spenneman (1987) on the effect of wave action on sites located on the shoreline in Tonga, demonstrated that day-to-day wave erosion played one of the most damaging roles in site destruction. Although occasional storm surges, he argued, were the most destructive force as they had the capacity to wash away entire sites in a single occasion. The destructive impacts of cyclones and surges have also been demonstrated in Vitiaz Strait (Lilley 1986) and the Northern Queensland coast of Australia (Bird 1992).

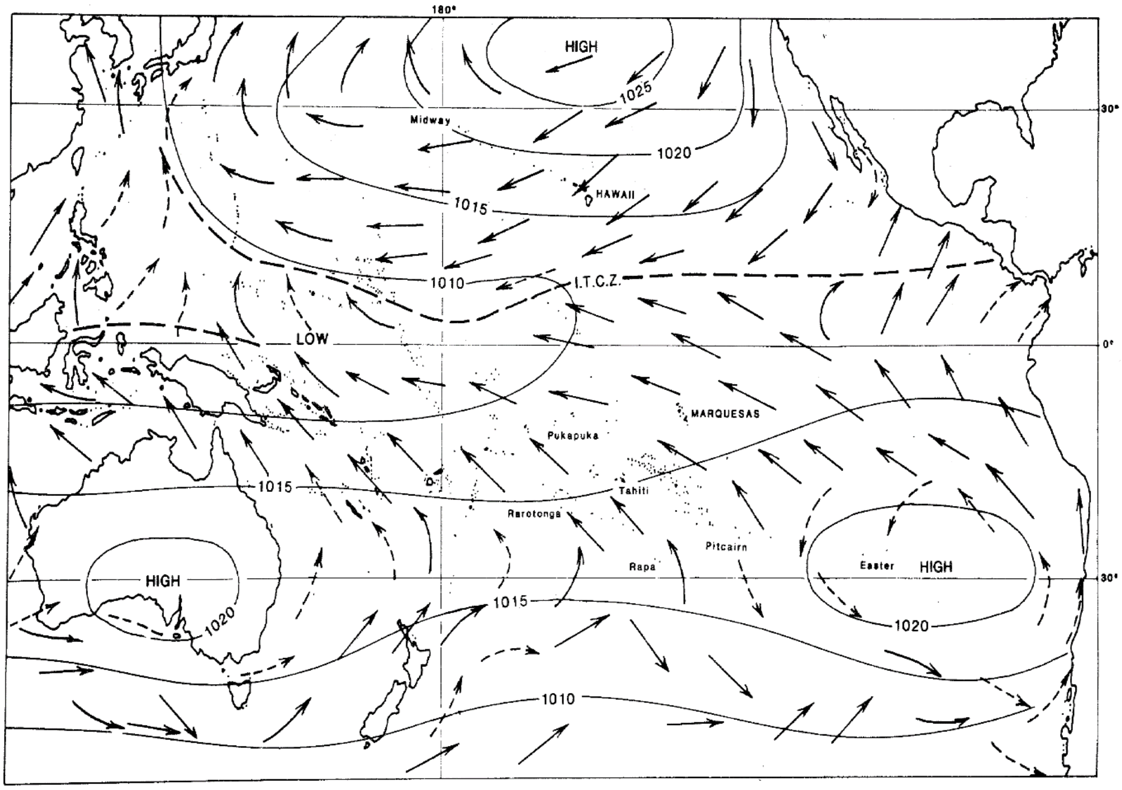


Figure 3.2 Prevailing wind directions in the Pacific in the southern winter (Irwin 1989: Fig. 2).

3.1.2 Geographic and Geological Terrain

Solomon Islands is comprised of about 1000 islands, cays and atolls and has a total land area of approximately 28,000 sq. km. For the purpose of this discussion on the prehistory of Solomon Islands, the region is grouped into four geographic units: Northern, Western, Central and Eastern Solomons (see Figure 1.2). Grouping the islands in this manner is done in accordance with previous major archaeological studies of the region (Sheppard and Walter 2006; Walter and Sheppard 2017). The groups are based largely on spheres of cultural and linguistic interaction that are ultimately founded on geographical proximity and historical trajectories of migration and dispersal (Walter and Sheppard 2017: 13). The Northern Solomons include Buka, which marks the northern end of island intervisibility in the Solomons, Bougainville and the Shortland Islands. The Central Solomons comprise Guadalcanal, Malaita, Makira and Ulawa and Rennell and Bellona. The Eastern Solomons include Santa Cruz (Nendo), a high volcanic island, and the small and generally low-lying islands of the Reef Islands, the Duff (Taumako) Group, Vanikoro, Anuta and Tikopia. The Western Solomons, as described briefly in Chapter 1, are made up of Choiseul, Isabel and the New Georgia group. The geographic and topographic terrain of the Western Solomons is described first, followed by an overview of the geology of the region.

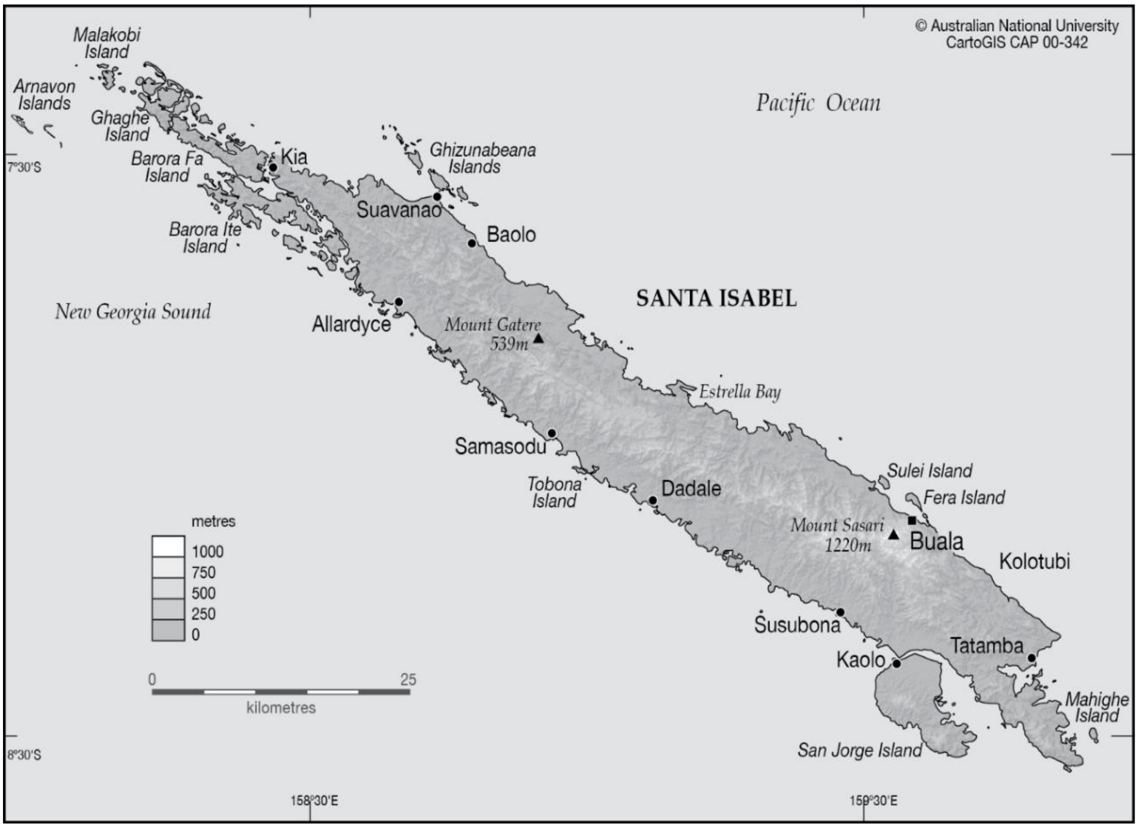


Figure 3.3 Elevation map of Santa Isabel. (Source: ANU CartoGIS).

Isabel is the longest province of Solomon Islands, extending about 235 km from the south-eastern tip of the mainland to Malakobi Island and surrounding islands located at its most northwest point (Figure 3.3). The mainland is about 3490 sq. km in size and lies on a northwest to southeast axis. Numerous islands lie offshore the mainland and are concentrated primarily at the island's northwest as well as some major islands being located in the southeast. Fera Island, where one of two grass airstrips on Isabel is situated, sits opposite the provincial town of Buala in the south-eastern end of the province. The nearby island of San Jorge is about 200 sq. km in size and is the largest of Isabel's offshore islands.

In northwest Isabel there is an archipelago of approximately 100 islands, most of which are low-lying, uninhabited sandy islets and small mangrove-forested coral islands. Extensive coral reef flats enclose most of the northern fringe of the archipelago and provide some protection from heavy seas. There is increasing evidence, however, for rapid land loss and islands becoming submerged in the northwest district (Albert *et al.* 2016). Some of the larger offshore islands in the area include Barora Faa and Barora Ite ("Faa" meaning big and "Ite" small in the local Zabana dialect), Gaghe Island, Nidero Island and Papatura Faa located opposite Suavanao, the second of two grassy airstrips located on the province. On the mainland of northwest Isabel, coastal areas particularly around Suavanao are low-lying and characterised mainly by swampy or lower river valleys. Moving gradually inland, the terrain becomes more precipitous but with hills and ridges not exceeding 150 m abs. The highest peak on Isabel is Mt Sasari located near Buala along the central mountainous backbone of the province.

Choiseul is slightly smaller than Isabel and occupies an area of approximately 3208 sq. km. It extends for about 185 km in a northwest to southeast axis. The province comprises three major islands: the Choiseul mainland itself, Rob Roy Island which has a submerged coastline and is separated from the mainland by a narrow passage, and Wagina, a large emergent coral reef island. The latter two, which are 200 sq. km and 243 sq. km in size respectively, make up the southeast end of the province along with over 100 coral islands, sandy islets and isolated reefs. The topography of the province shares similarities with Isabel (Figure 3.4).

Southeast Choiseul is characterised primarily by low-altitude ridges and hills, low terraces and sea level to slightly elevated islands and islets (Hansell and Wall 1975: 5). Apart from Laena Island whose central peak is about 200 m abs and Rob Roy Island which reaches 150 m, Wagina and the majority of offshore islands in the area are generally low-lying and do not exceed 40 m. Kumboro Peak, which is located on the mainland near Laena Island, stands about 602 m abs, and the largest mountain on Choiseul which is located near the centre of the mainland, Mt Maetambe, elevates to just over 1000 m. The provincial capital is located on Taro Island, a small island about 1.5 sq. km in size located at the far northwest end of Choiseul which houses one of the two grass airstrips that have been built on the province. The other airport is located on Kaghau Island located at the southeast end of the province.

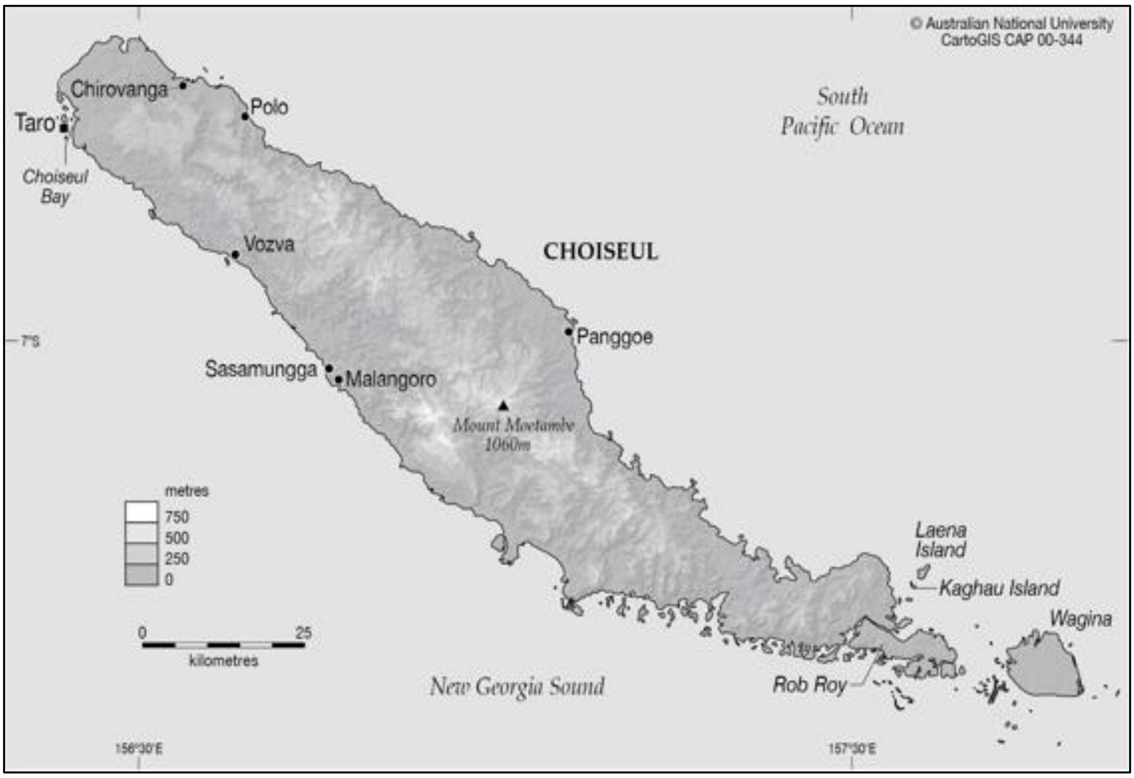


Figure 3.4 Elevation map of Choiseul. (Source: ANU CartoGIS).

Geologically, Solomon Islands forms part of the Greater Melanesian volcanic arc system which stretches from New Britain to Tonga and marks the collisional zone between the Australia and Pacific tectonic plates (Petterson *et al*. 2011: 36) (Figure 3.5). Its double chain of islands, which form an upstanding topographic block called the Solomon block (Petterson *et al*. 1999: 36), was formed by a complex geological history of subduction and uplift that occurred at the boundary between these two major plates. Collisions between minor tectonic plates, specifically the Woodlark Plate and Solomon Sea Plate, as well as between the Ontong Java Plateau (OJP) and the Solomon block also influenced the geological formation of the archipelago (Cowley *et al*. 2004: 16).

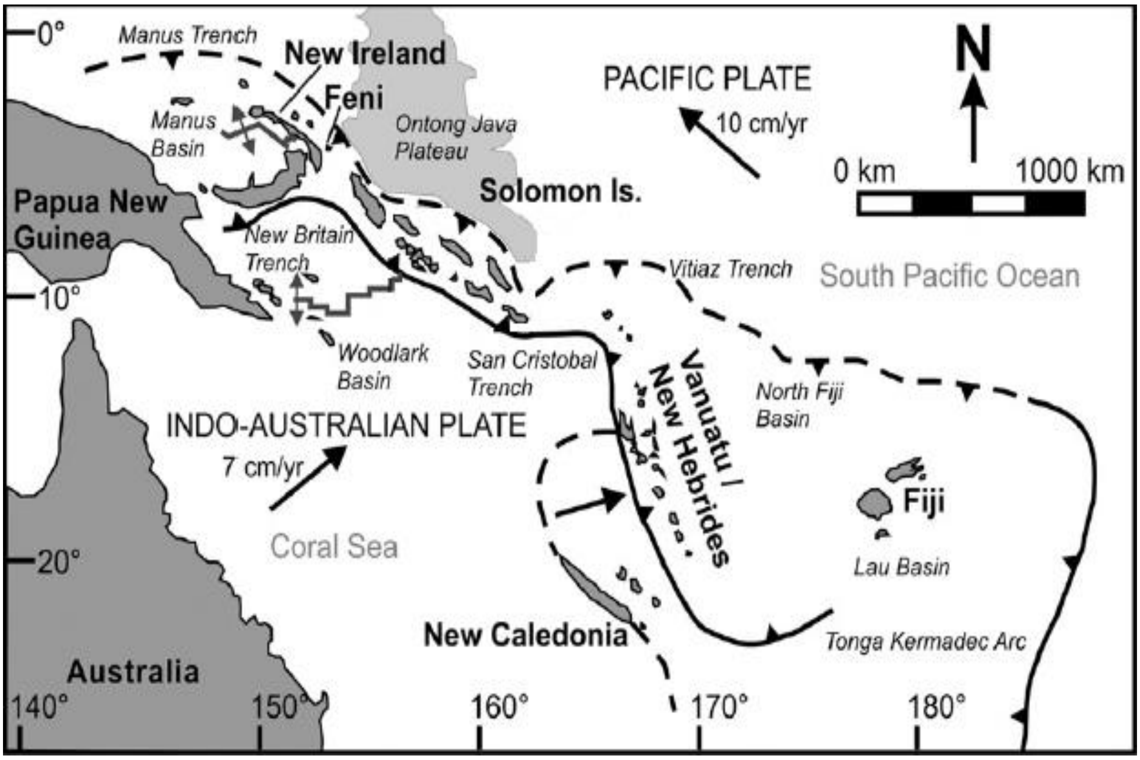


Figure 3.5 Map of the southwest Pacific and the Greater Melanesian Arc. Active arcs shown with solid lines and inactive/intermittently active arcs shown as dashed lines. Arrows show relative plate motions. (Adapted from Petterson et al. 2011: Fig 1A).

The Solomon block can be divided into five crustal units or geological terrains (Figure 3.6) (Petterson *et al*. 1998, 2011). Building upon a geological province model originally designed by Coleman and others (Coleman 1970; Coleman and Kroenke 1981), Petterson and company reframed their model using distinctive lithology, age and geochemistry of base sequences and presence or absence of arc sequences. Within their model, Guadalcanal and Choiseul form a single terrain, the South Solomon MORB (Mid-Ocean Ridge Basalt) Terrain, and share a complex but similar suite of volcanic, sedimentary and metamorphic rocks. The Ontong Java Plateau Terrain comprises most of Isabel, Malaita and Ulawa, all of which are dominated by marine limestones and which form an obducted part of the OJP. The Central Solomon Terrain includes the Shortland Islands, San Jorge Island, part of southern Isabel and the Florida Islands. These islands are characterised by sedimentary and limestone deposits overlying basic to ultrabasic basaltic basement sequences (Petterson *et al*. 1998: 46). The New Georgia Terrain, which encompasses the New Georgia group, Russell Islands and Savo, exhibit distinctive landforms and rock types of comparatively recent volcanism.

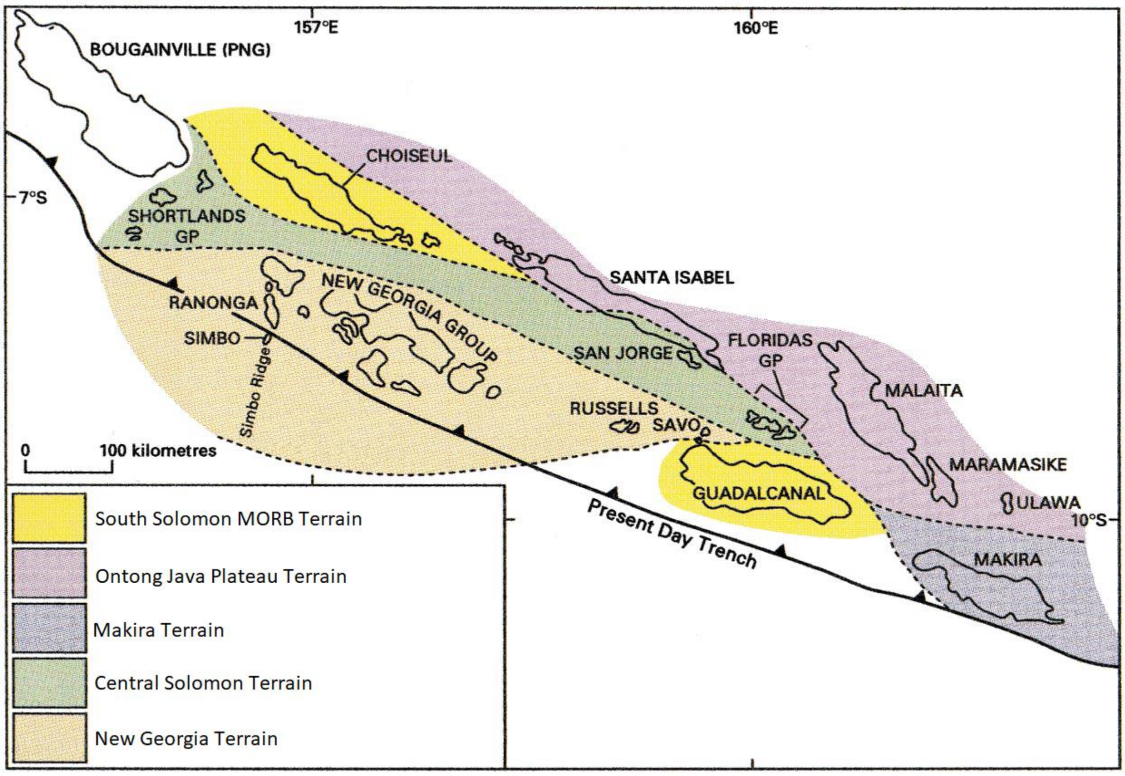


Figure 3.6 Geological terrain model of Solomon Islands (adapted from Petterson et al. 1998: Fig. 2).

Examining a more detailed geological map of the Western and Northern Solomons, Choiseul is demonstrated to be one of the most structurally complex islands (Figure 3.7). Most of the island is comprised of andesitic rock created from its two volcanoes, Maetambe and Kumboro. These volcanic piles are composed of andesitic pyroclastic deposits which, petrochemically, are calc-alkaline rocks (Coulson 1985: 647). Ultrabasic inclusions also characterise much of the southern end of Choiseul and Rob Roy Island. Pockets of metamorphic rock - Choiseul schists - are found throughout southern and central Choiseul. At the northwest end of Choiseul, sedimentation in the Middle and Late Tertiary is concentrated forming well-banded tuffaceous greywacke, marls and siltstones (Hansell and Wall 1976: 5).

Northwest Isabel is comprised predominantly of marine and terrigenous sediments. While the central and southern parts of the island are composed mainly of basaltic rock, metabasics (lavas and gabbros) and metasediments. The Shortland Islands group is also composed partly of andesitic rock that formed more recently in the Pliocene. Reef limestone and sediments, however, make up most of the island group.

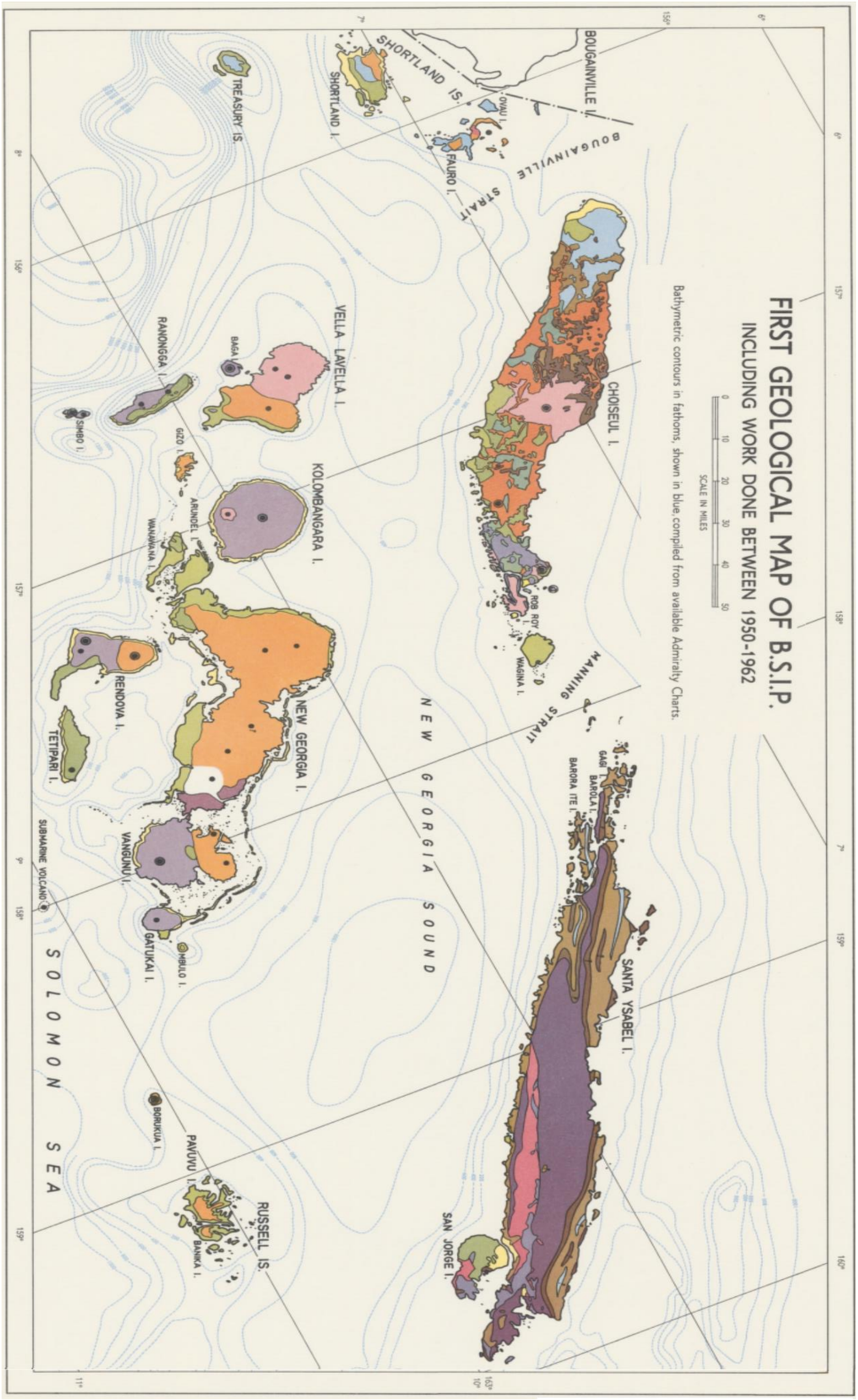


Figure 3.7 Geological map of Solomon Islands (The British Solomon Islands Geological Record 1959-62).

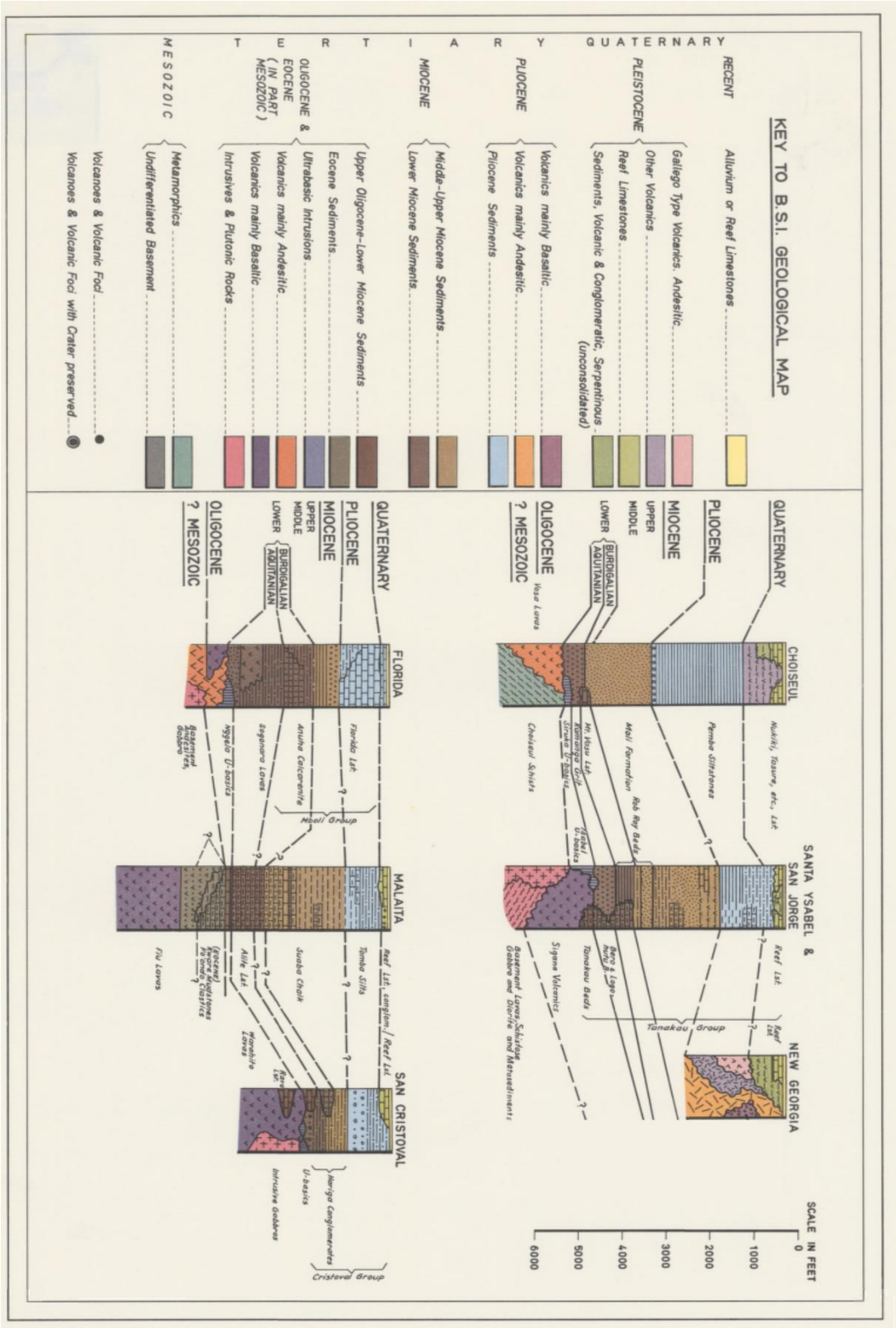


Figure 3.7 Geological map of Solomon Islands (The British Solomon Islands Geological Record 1959-62) (ctd.).

The New Georgia group consists of multiple emerging and coalescing island volcanoes encircled by a complex of fringing reefs and lagoons (Coulson 1985: 647). The encircling reefs and lagoons, specifically Roviana Lagoon, is comprised of raised limestone, backreef lagoonal sediments, calcareous clay, siltstone and sandstone (Langford 1987). In contrast to Choiseul, lavas in the New Georgia group range from highly mafic picrite basalts, containing over 50 percent olivine, to hornblende andesites. Olivine basalts and pyroclastics are most common, along with basaltic andesites (Coleman 1970: 296).

3.1.3 Flora and Fauna

There are an estimated 4500 plant species in Solomon Islands (Hancock and Henderson 1988: 9). Lowland rainforest is the most widespread and species-rich formation of vegetation in the region. Isabel, New Georgia and Choiseul have large areas of forest dominated by single species such as *Campnosperma brevipetiolata*. This a light-demanding species and usually an indication where human disturbance has impacted upon canopy growth (Hviding 2015: 57). Banyan figs (*Ficus prolixa*), known in Solomon Islands Pidgin as 'Abalolo', and *Terminalia calamansanay* are commonly found alongside the dominant strata (Whitmore 1969). Seasonally harvested nut varieties found throughout the Solomons include *Canarium indicum* ('ngali nut'), *Barringtonia* (cut nut), and *Terminalia kaernbachii* (okari nut) (Evans 1999). Ngali nut is among the oldest and most important crops in the whole of Melanesia (Yen 1996), and today is an important food source for many villages in southeast Choiseul and northwest Isabel.

Cocos nucifera, the coconut tree, is widely exploited today as a food source as well as for the production and export of copra. Coconut groves are managed on a relatively small scale by individual families in southeast Choiseul and northwest Isabel. They have replaced some expanses of mangrove and beach forest on the coasts of these areas, although logging is by far the leading cause of forest destruction and disturbance (Katovai 2015, 2016, *et al*. 2016). In addition to fruit and nut trees, starchy garden crops are a fundamental part of traditional diet and include *Colocasia esculanta* (taro) which is commonly grown in irrigated ponds, *Cyrtosperma chamissonis* (giant swamp taro), *Dioscorea esculenta* (lesser yam), *Manihot esculenta* (cassava or tapioca) and *Ipomoea batatas* (sweet potato or kumara). The latter two originated in Central and South America and have become widespread only in the last century in the Solomons (Hviding 2005: 149).

Solomon Islands' terrestrial animal biodiversity is highest amongst its bird, reptile and amphibian species[3]. Over 300 bird species have been recorded in the Solomons, with about 70 of these being endemic (Lepage 2019). Common varieties found in lowland forest regions of Choiseul and Isabel include *Ducula pistrinaria*, the Island Imperial Pigeon or locally named *kurukuru*, and smaller fantails and parrots such as *Chalcopsitta cardinalis*, the Cardinal Lory. A culturally and ecologically significant, but likely extinct, bird species endemic to Choiseul is *Microgoura meeki*, the 'Kukuvojo' or Choiseul Crested Pigeon[4] (Lavery *et al.* 2016: 80). Seabirds such as the *Fregata ariel*, Lesser Frigatebird, and *Haliaeetus sanfordi*, the endemic Solomon Sea-eagle, nest on islands in Manning Strait. On parts of the Arnavon Islands, its sandy and warm beaches serve as a niche for *Megapodius eremita*, Melanesian megapodes, which can lay up to over 300 eggs per year and are widely harvested throughout Solomon Islands (Sinclair *et al*. 2010: 125).

Mammals and land crustaceans, specifically the coconut crab (*Birgus lastro*), form the remaining variety of terrestrial fauna found in Solomon Islands. Thirty-one indigenous mammal species and 16 endemic mammal species have been identified in Solomon Islands (Flannery 1995: 15). These are comprised predominantly of cave-dwelling bats and larger fruit bats (*Pteropodidae*) including the heaviest and widely hunted species, Solomon Flying Fox (*Pteropus rayneri*). The remaining endemic mammal species include nine varieties of the rodent family *Muridae*. Two large arboreal rats are unique to Bougainville and Choiseul: the rare *Solomys ponceleti* (Poncelet's Giant Rat) and the more common *Solomys salebrosus* (Bougainville Giant-rat) (Flannery 1995: 163-166). Mammals introduced to the Solomons and which formed part of prehistoric traditional subsistence economies include the pig (*Sus scrofa*), dog (*Canis familiaris*), and Pacific rat (*Rattus exulans*). These species, along with the chicken (*Gallus gallus*), originated in Southeast Asia and were brought to the Solomons by Austronesian-speaking communities during the Lapita period approximately 3000 years ago. The northern common cuscus or grey cuscus (*Phalanger orientalis*), which is sporadically found throughout the Solomons including Isabel and Choiseul, was introduced much earlier

[3] This is excluding insects and other arthropods such as spiders, centipedes and land crustaceans which together may number over 45,000 species (Lavery *et al*. 2016: 37).
[4] The large ground-dwelling pigeon features on the provincial flag of Choiseul and is reputed by local informants to be found on Mt Maetambe.

near the start of the Holocene most likely from Nissan or New Ireland (Wickler 1990: 141).

Solomon Islands holds one of the highest levels of coral diversity and one of the richest concentrations of fish species (over 1000 species) in the world. There are countless reef systems in the Manning Strait region, some of which stretch for several hundreds of kilometres along the northern coastlines of Isabel and Choiseul. The Arnavon Islands and its over 100 sq. km surrounding coral reef system support a particularly rich marine ecosystem. Mangrove mudflats on the islands and their offshore reef structures are inhabited by a wide array of shellfish and coral reef fish including the Green Humphead Parrotfish (*Bolbometopon muricatum*), known locally as *topa*. This species, which can weigh up to 45 kg and grow to lengths of 1.3 m, is an economically significant fish species in the Arnavons marine environment (Hamilton *et al*. 2008). The Arnavon Islands are also home to two turtle species, the Green Sea Turtle (*Chelonia mydas*) and Hawksbill Turtle (*Eretmochelys imbricata*), and large schools of tuna (e.g. bonito - *Katsuwonis pelamis*) and other tropical migratory and predatory fish. The exploitation and management of the abundant array of faunal and floral species over the millennia in Solomon Islands has been integral to the growth of its human populations and development of the region's rich cultural diversity. This is touched upon in the following section.

3.2 An Overview of the People

Solomon Islands is inhabited by a predominantly Melanesian population although there is considerable admixture with Polynesian and Micronesian populations. In addition to Rennell and Bellona, there are eight Polynesian Outliers in the Solomons archipelago (Walter and Sheppard 2017: 24-27). Polynesian Outliers are islands typically located considerable distances from larger landmasses and are uniquely characterised by being inhabited predominantly by Polynesian speakers (Kirch 1984). The majority are located along the northern and eastern margin of the Solomons, and include, for example, Ontong Java and Sikaiana which are situated a few hundred kilometres north to northwest of Isabel. The settlement of these outliers occurred as back migration events out of Polynesia that probably began as early as 800 BP (Kirch and Yen 1982). Due to their isolation, outlier communities have retained distinctive languages and identities although there has been evidence of occasional interaction with distant neighbours such as trading between Ontong Java and northwest Isabel communities

(Guppy 1887) (described in Chapter 4). More recently, largescale migrations of Kiribati communities to Solomon Islands, which were organised by the British Colonial Administration in the 1950s and '60s, have resulted in Micronesian populations inhabiting parts of Solomon Islands (Tabe 2011, 2016). These include Wagina, Shortland Islands, Gizo and parts of New Georgia, and Honiara.

The remainder of this section is centred upon providing further contextual information about the distribution and linguistic and genetic diversity of Solomon Islanders, with special attention given to Choiseul and Isabel. It is divided into three segments. The first examines the distribution of village populations on Choiseul and Isabel, and touches upon ethnographic descriptions of the extent of coastal versus inland settlement on these islands. The second provides an overview of the number, distribution and origin of languages spoken on these provinces. The third briefly reviews genetic research carried out in Solomon Islands which contribute insight into prehistoric settlement and mobility patterns in the region.

3.2.1 Population Distribution

The total population of Solomon Islands in 2019 according to the National Statistics Office on their official website was 680,806 (SINSO 2018). Less than twenty percent of the country live in urban areas, and two thirds of them in the capital city Honiara. Most rural communities live along the coast although there are pockets of highly concentrated populations in inland areas of Malaita and Guadalcanal, the two most populated provinces in the country. Choiseul and Isabel have comparably low population sizes, currently projected at approximately 35,000 each and both have low densities of about ten people per sq. km. (SINSO 2009: 20). In Choiseul, following the 1976 Census, the densest inland populations were demonstrated to be located in the vicinity of Chirovanga (Figure 3.8). Prior to the arrival of European missionaries and the cessation of head-hunting practices at the start of the twentieth century, inland settlement is likely to have been much denser in Choiseul and Isabel.

Today, social distinctions are commonly made between people from urban centres or '*taon*' and rural areas or '*vilig*'. Historically, a more common social divide has existed between coastal or 'saltwater' people and inland 'bush' people (Roe 2000). In Isabel, ethnographer Geoffrey White described that "there was a broad division between coastal and inland people which was a basis for both trading and raiding" (1978: 56). Specifically, he was contrasting A'ara speakers who were swidden agriculturalists and had little maritime knowledge to populations living on the coast to the east in Bughotu and to the northwest at Kia. The latter were "relatively sophisticated maritime peoples…", he noted, "accomplished in constructing canoes, making nets, fishing and hunting turtle" (White 1978: 56).

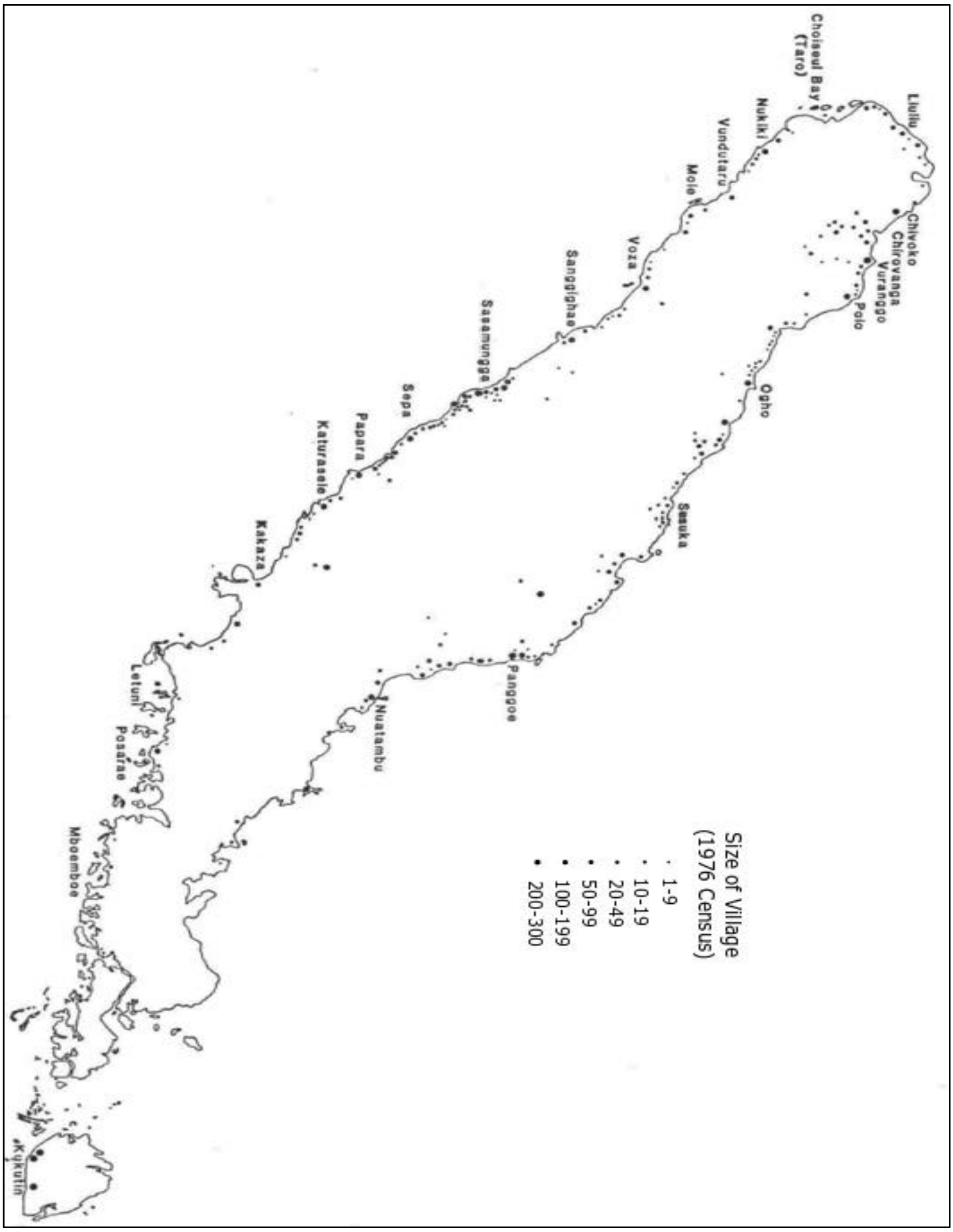


Figure 3.8 Distribution of Choiseul villages in 1976. (Figure: Friesen 1986: Fig. 2.1).

In Choiseul, anthropologist Harold Scheffler acknowledged the existence of a distinction between coastal and bush people although relayed a slightly different account to White's observations in Isabel. He stated that "the Choiseulese, though they now live on the coasts, consider themselves a 'bush people', and they do not look to the sea as a primary source of subsistence" (1965: 5). He asserted that until the beginning of the twentieth century, people dwelled in small hamlets dispersed across ridges located inland and that coastal ranges were preferred although many lived in the centre of the island. Other accounts have not portrayed *all* of Choiseul people as 'bush people' and have indicated strong evidence of coastal and inter-island interaction, particularly in the far northern end of the province. This is discussed further in Chapter 4.

3.2.2 Linguistic Diversity

There are approximately 83 languages documented in Solomon Islands, 63 of these in the main Solomon Islands and 20 in the Northern Solomons (Buka and Bougainville) (Tryon and Hackman 1983; Terrell 1977). In the main Solomons archipelago, four Non-Austronesian (NAN) or 'Papuan' languages are spoken as well as five languages of the Samoic-Outliers branch of the Polynesian family. The few surviving NAN languages, two of which are spoken on Vella Lavella and Rendova in the New Georgia group and two in the Russell Islands and Savo located northwest of Guadalcanal, are remnants of a larger number that would have been present in the region prior to the arrival of Oceanic Austronesian speakers (Pawley 2009: 521). Dunn *et al.* (2005) have hypothesised a major split in NAN languages in this part of Melanesia is likely to have occurred around 10,000 BP.

The remaining and most commonly spoken languages in the Solomons archipelago are Austronesian which originated from a Proto-Austronesian language spoken by a Neolithic population in East or Southeast Asia (Blust 2013; Pawley and Ross 1993: 425). These languages, which form part of the Oceanic family, are divided geographically into two major sub-groups: Northwest Solomonic and Southeast Solomonic (Figure 3.9). These sub-groups are separated by the Tryon-Hackman Line which runs approximately north-south between Isabel and Malaita.

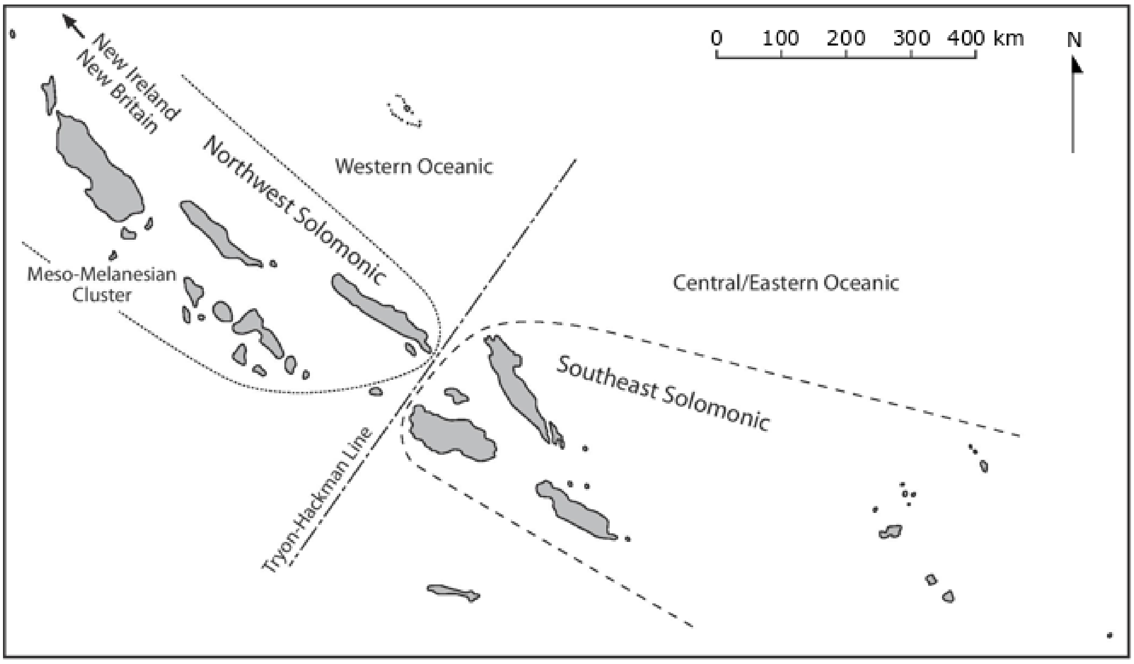


Figure 3.9 Distribution of main branches of Austronesian languages of Solomon Islands separated by Tryon-Hackman Line. (Figure: Walter and Sheppard 2017: Fig. 2.2).

Languages of Northwest Solomonic are generally perceived as more variable compared to the more conservative Southeast Solomonic group. Northwest Solomonic was originally divided by Ross (1988) into five primary subgroups which included Nissan-Buka-north Bougainville, west Bougainville, south and east Bougainville-Shortlands, Choiseul and Santa Isabel-New Georgia group. This has been revised more recently by Pawley (2006, 2009) who has separated the New Georgia group and Isabel, arguing that there is diminutive evidence to merge the group and that any period of linguistic development must have been short-lived. Pawley has also built upon Ross's (1988: 261-262) explanation that Northwest Solomonic derived from a Meso-Melanesian linkage that originated in the vicinity of south New Ireland. He has suggested that the languages dispersed to the Western Solomons from the area consisting of Buka, north Bougainville and Nissan subsequent to the Proto-Oceanic breakup and can be correlated with the timing of the Lapita expansion (Pawley 2009: 536).

There are eight languages spoken on Choiseul and about eight documented on Isabel. On Choiseul, these include the northern languages Vaghua, Varisi, Ririo (which has very few speakers) and the central and southern languages Mbambatana, Katazi, Sengga, Kirungella and Avaso (Capell 1943; Lanyon-Corgill 1944) (Figure 3.10). Vaghua, Varisi and Ririo form a relatively distinctive unit spoken in the northern one third of the island in contrast to Mbambatana, Sengga, Kirunggela and Avaso which are mutually intelligible dialects spoken in central and southeast Choiseul (Scheffler 1965: 8; Tryon and Hackman 1987).

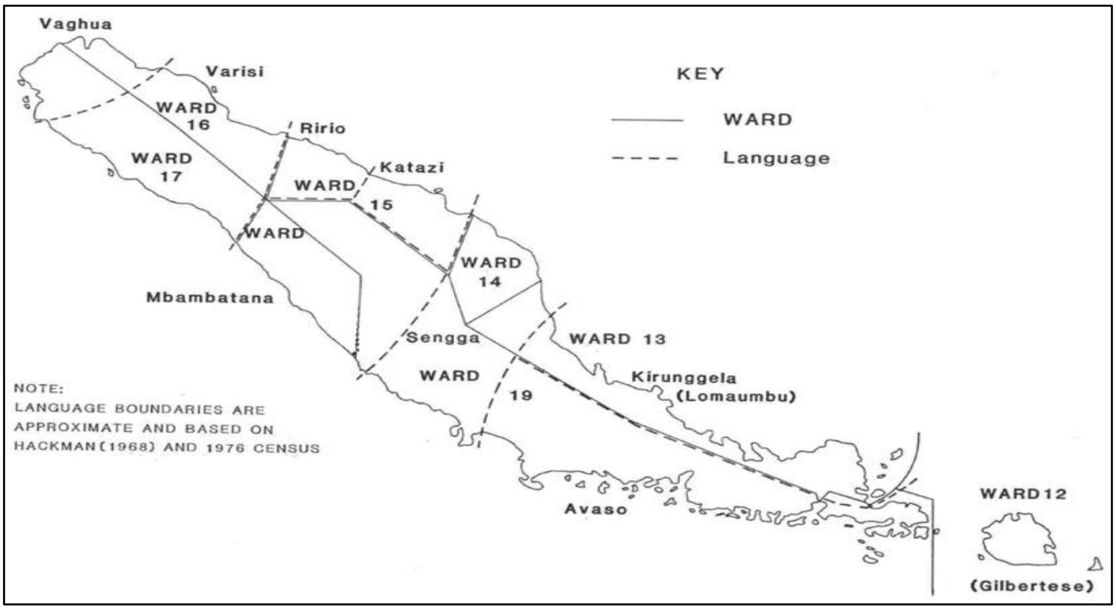


Figure 3.10 Map of Choiseul showing distribution of languages and administrative wards. (Adapted from Friesen 1986: Fig. 2.2).

On Isabel, the most commonly spoken languages include Zabana in the northwest, Cheke Holo (or Hograno) near the provincial capital in the Maringe-Hograno areas, and Bughotu in the southern peninsula (Ivens 1940; White *et al.* 1988; Palmer 1999). Apart from Bughotu, which is a Southwest Solomonic language that shares affinities with Ngella and parts of Guadalcanal and Malaita, all Isabel languages are part of the Northwest Solomonic group. The five remaining and rarer Isabel languages include Gao spoken in the southeast corner of the island, Blablanga, Zazao (Kilokaka), Kokota and Laghu (Figure 3.11). Laghu became extinct in 1984 and its speakers, who once inhabited the area known as Katova in the middle-northern portion of the island, are recorded by White (*et al*. 1988: vii) to have almost been eradicated by head-hunting raids in the nineteenth-century. The modern distribution of languages in Isabel was also impacted upon by resettlements of inland villages to the coast that were influenced partly by growing missionary influence during the early twentieth-century. As a result, many of the same languages are spoken on opposite coasts and form dialect 'bands' running crosswise along the island (Figure 3.11). This is also reflected, although less uniformly, in the geographical distribution of languages on Choiseul (Figure 3.10; or see Tryon and Hackman 1987: Map 2).

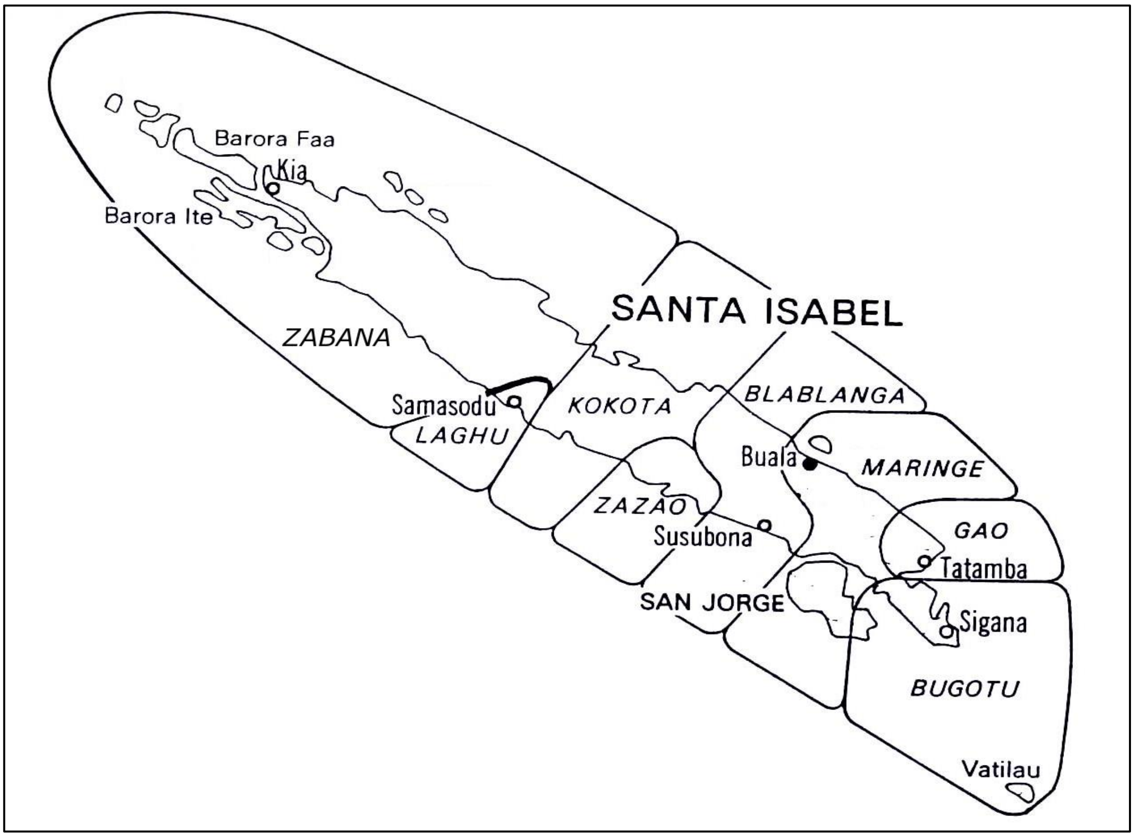


Figure 3.11 Map of Isabel showing distribution of languages. (Figure: Wurm and Hattori 1981).

3.2.3 Biological Ancestry

Genetic studies performed in the Indo-Pacific region have contributed important insights into the origin and biological ancestry of Pacific Islanders. For Solomon Islands and other linguistically diverse regions in Near Oceania, genetic research has been particularly valuable to improving our understanding of the relationship between genetic and linguistic variation. Genetic variation seen amongst male populations in the Indo-Pacific has shown evidence of spatial patterning between Y-chromosome haplogroups and major language groups. For example, broadly speaking, M-M106 correlates with the geographical spread of Papuan languages, while O-M175 is associated spatially with Austronesian-speaking areas (Cox and Lahr 2006: 35). The latter haplogroup, and its sublineage O-M122, have commonly been interpreted as a marker of the spread of Austronesian-speaking populations into Near and Remote Oceania (Kayser *et al.* 2000, 2003). Similarly, a mtDNA type B4a1a1 is found in high frequencies throughout the Pacific where its distribution has been described as near ubiquitous and has come to be referred to as the 'Polynesian motif' (Melton *et al.* 1995; Redd *et al*. 1995). These broader patterns have typically not held on a smaller scale of genetic variation observed in contemporary populations in Solomon Islands. In particular, no significant genetic differences have been observed between Austronesian and NAN-speaking populations in the main Solomons chain which is most likely due to extensive gene flow that occurred over time through interaction (Cox and Lahr 2006; Delfin *et al.* 2015; Issiki *et al.* 2018).

Recent genetic research undertaken in Solomon Islands has portrayed the archipelago as an important bridge between Near and Remote Oceania as is reflected in a widespread admixture of Asian and Near Oceanic (or Papuan) biological ancestry (Delfin *et al*. 2012). This study, which is the most comprehensive genetic investigation of populations in the Solomons to date, involved the sampling of over 700 individuals from across all major provinces in the country for mitochondrial DNA (mtDNA) and non-recombining Y-chromosomes (NRY). The authors made three findings that were significant to reconstructing the nature and timing of settlement of the Western Solomons. First, they identified the Bismarck Archipelago region, and specifically New Ireland and New Hanover, as a major source of mtDNA and NRY types found in the main Solomons. This can be interpreted to support gradual, largescale migrations of late Lapita communities into the Northern and Western Solomons from New Ireland or at least the wider Bismarck Archipelago region who made similarly decorated incised and applied relief ware.

Second, the authors found that genetic divergence was not observed between populations living on provinces either side of the Tryon-Hackman Line. Rather, there was a much stronger correlation between geographic distance and genetic relatedness in the Solomons, particularly among Y-chromosomes. Interestingly, it appeared that over time males were moving considerably among groups within the boundaries of northwest or southeast Solomons, whereas female migration exhibited no such geographic constraint (Delfin *et al.* 2012: 557). They interpreted this as possibly reflecting the importance of traditional head-hunting alliances and the capture and integration predominantly of females from opposing alliances.

Third, from the NRY data, Delfin and authors also proposed the main Solomons may have been settled during the early Holocene, which is much earlier than what has been made evident from the archaeological record. They explained that "old NRY paragroups (C-RPS4Y and possibly M-P256) are present in the Solomons but are lacking in the rest of Near Oceania, in keeping with a relatively old colonization of the Solomons. NRY haplogroup M2-M353 supports this view, as our data suggest that it arose 9.2 kya in the Solomons" (Delfin *et al*. 2012: 561).

Other genetic studies undertaken in the Solomons have made important contributions to our understanding of the origin and migration history of populations in the Eastern Solomons (Friedlander *et al.* 2002, 2007) and of the impacts of European contact and disease introduction to genetic bottlenecking (Ricaut *et al.* 2010) (see reviews by Sheppard 2019a and Matisoo-Smith 2015). These are not discussed in any more detail, however, as they do not provide additional insight to addressing the research questions proposed in this thesis.

3.3 Conclusion

This chapter has outlined important characteristics of the environmental setting of the study region and touched upon the complex cultural geography of Solomon Islands. These overviews will be drawn upon to discuss two points concerning the prehistoric colonisation of the Western Solomons and evidence of changes that occurred to settlement and mobility patterns of its inhabitants in the distant past. The first is centred upon the physiographic landscapes of Choiseul and Isabel acting as influential factors in the settlement of these islands. The current distribution of villages in both provinces reflects a pattern of well-drained and lowland coastal margins being favoured over more mountainous and poorly drained areas which has been documented across much of Island Melanesia (Terrell 1977). Particularly across much of Choiseul, soils have been described as generally porous and subject to erosion and leaching (Hanswell and Wall 1976). For example, it has been documented in Sasamungga in central Choiseul that gardened land was typically never suitable for more than one planting and had to be left fallow for upwards of ten to twenty years (Scheffler 1965a: 11). The abundance of marine food resources is also likely to have drawn people to settle coastal areas of Manning Strait in the past. While occasional cyclonic weather and wave surges are likely to have left coastal communities vulnerable, the generally safe and sheltered sea crossings strewn amongst the islands in Manning Strait are likely to have encouraged inter-island travel. The role Manning Strait played in influencing prehistoric settlement and interaction patterns is discussed further in Chapter 10.

The second point is the insight provided by linguistic and genetic research into reconstructing the pre-Lapita settlement of Solomon Islands and the subsequent phase of Austronesian expansion. Overall, the linguistic evidence provides the strongest support for a NAN occupation of the main Solomons prior to the arrival of Austronesian potting communities, which so far has been hinted at archaeologically only by Roe's (1993) investigation of Vatuluma Posovi on Guadalcanal. In relation to the timing of the arrival of NAN populations, Dunn *et al*. (2005) hypothesised that a major split in NAN languages in this part of Melanesia occurred sometime around 10,000 BP. Similarly, Delfin (*et al.* 2012: 561) suggest a date of colonisation of around 9200 BP from their analysis of Y-chromosome data. Colonisation of the main Solomons by small NAN populations travelling on-foot or over narrow sea crossings during the early Holocene is possible, as is supported by evidence of people reaching Buka by 29,000 BP. However, I contend that archaeological evidence and secure radiocarbon dating are necessary to substantiate this notion. In Chapter 10, evidence of a pre-Lapita presence in the Western Solomons is discussed in further detail.

The review of the linguistic and genetic research also demonstrated that modern populations in the main Solomons share the strongest linguistic and genealogical ties with the Bismarck Archipelago, namely New Ireland. Specifically, Pawley (2009: 536) has argued that Austronesian languages of the Western Solomons derived from a Meso-Melanesian linkage that originated in the vicinity of south New Ireland. He added that their dispersal from the area consisting of Buka, north Bougainville and Nissan coincided with the timing of the Lapita expansion. Equally, Delfin and authors (2012) identified New Ireland and New Hanover as a major source of mtDNA and NRY types found in the main Solomons. Of interest to mobility patterns of communities in the Western Solomons during late prehistory, the authors also interpreted that over time males were moving considerably among groups within the boundaries of northwest or southeast Solomons, whereas female migration did not exhibit a similar geographic constraint (Delfin *et al.* 2012: 557). They interpreted this as possibly reflecting an impact of head-hunting and specifically the capturing and integrating of females, more often than males, from raided villages. In the next chapter, head-hunting and other important cultural aspects of Western Solomons' late prehistory are discussed in the context of a comprehensive review of ethnographic and historical writings about Solomon Islands.

Chapter 4 Review of Ethnographic and Historical Writings

This chapter is a review of ethnographic and historical writings about Solomon Islands with special attention given to the documentation of cultural traditions of Choiseul and Isabel peoples. It is divided into three sections. The first section focuses on three important aspects of the culture history of Choiseul and Isabel documented in the ethnographic literature. These are origin and migration stories, trading systems and shrine and burial practices. A discussion is given at the end of this section about ancestral homelands of Choiseul and Isabel inhabitants and the development in late prehistory of regional networks of interaction in the main Solomons. The second section outlines the contact history of the Western Solomons, focusing primarily on early European encounters, head-hunting and warfare, and Christianisation. At the end of this section, a discussion is also given about major impacts to settlement patterns and cultural practices experienced by Choiseul and Isabel communities in the last two centuries. The chapter is then concluded with a brief summary highlighting key arguments and interpretations made in these discussions.

4.1 Ethnographic Research

The rich diversity of traditional (*kastom*) knowledge and cultures in Solomon Islands has made it an attractive site of ethnographic fieldwork over the course of the development of modern anthropological practice. The term *kastom* is a Pidgin word commonly used by Melanesians as a broad-brush term to encapsulate indigenous cultural practices, norms, and knowledge. It is likely to have emerged in colonial plantation communities to assert 'native' Melanesian agency over their own sense of knowing in the face of Western and Christian ideology (Gegeo 1994). *Kastom*s are shared collectively and have commonalities that create social bonds between individuals or cultural groups of different ancestries. For example, Ni-Vanuatu may share similar *kastom* practices with Solomon Islanders. *Kastom* can also mean and represent the individuality of cultural groups, as is applied in this review of ethnographic documentation of Choiseul and Isabel *kastoms* (see further discussion of '*kastom*' in Hundleby 2017: 117-18).

The three aspects of the cultures of Choiseul and Isabel peoples that are examined here were selected as they cater well to the limited amount of ethnographic literature written specifically about Choiseul and Isabel. Additionally, they were selected as they assist in reconstructing an understanding of the historical development of settlement and migrations, the formation and dissolution of exchange networks, and important regional differences observed between shrine and burial practices in the area. The first part reviews the limited documentation of origin stories of Isabel and Choiseul peoples as well as historical migratory movements related to totemic clans in Isabel. The second part reviews traditional exchange systems and trade networks in the Western Solomons, focusing predominantly on spheres of socio-economic interaction that have encompassed Choiseul and Isabel. The third part reviews ethnographic writings about shrine and burial practices recorded in Choiseul and Isabel which demonstrate regional distinctions that correlate with proximity between islands and historical links of migration and interaction.

4.1.1 Origin and Migration Stories

Apart from an emic ethnographic account written by George Bogesi in the late 1940s (Bogesi 1948), there is little published literature about the origins of Isabel people. Bogesi, who was born and raised in southern Isabel and is known most famously as Solomon Islands' first Native Medical Practitioner, wrote about the language, culture and history of Bughotu while under the supervision of Adolphus Elkin, Anthropology Professor at the University of Sydney. In addition to writing about migration and origin stories of Isabel people, he described kinship systems, gender roles and work in society, land and property, and activities of daily life such as gardening and fishing. "According to the folklore, songs and stories, and the traditions handed down from one generation to another", Bogesi wrote that, "all are agreed on the point that our ancestors came from the west" (1948: 208). He explained that Kia and northern Isabel were settled first before Bughotu, although did not specify where in the west the earliest ancestors travelled from. Some villagers Bogesi spoke with in Bughotu claimed that their ancestors travelled "via Marovo Lagoon [and] some via Kia or Choiseul, through Maringe and Nggao…" (*Ibid*). He added that after death it was believed a person's ghost travelled west ("*horu i tuhilagi*"), returning to where it came from. Bogesi highlighted that the exact whereabouts of *tuhilagi* were unknown, although he wrote that "some think it is at Moumolu" on San Jorge Island which is located west of Bughotu just off the mainland of southern Isabel (*Ibid*). San Jorge has been described elsewhere as the dwelling place of ghosts of Isabel as well as for Ngella and Savo inhabitants (Beattie 1906: 28; Codrington 1891: 308; White 1991: 110).

During a visit to Kia in 1950, Bogesi wrote, in unpublished field notes, that according to "popular belief amongst the ancestors of the people - Zabana", Isabel's earliest populations originated at a place called Vulega located on Barora Faa Island and on Barora Ite Island (Bogesi 1950: 2/3). The occupants of this region were responsible for subsequently settling the major populated areas of mainland Isabel including Kia, Bughotu, Hograno and Maringe. They were founders of the Posomonggo Clan and catalysts of the spread of the clan to the whole of Isabel. Bogesi recited a mythological story to explain why these populations migrated from the Barora region:

> *"A very fierce giant, named Koveleke, a man-eating brute, lived somewhere near Barora and ate several thousands. There people in fear of it, escaped by canoe and paddled away to Bugotu etc. Koveleke had a dog called Verete. The dog assisted him in devouring thousands of the people. Another giant also lived at Barora Ite, [and] devoured [a] quarter of the population. His name is Firifofo." (Bogesi 1950: 2/4).*

Bogesi expanded upon this, stating that killing human beings and cannibalism were unknown to the people of Barora before the days of the giants. But this changed following the migrations, and killing and cannibalism became widely practised. His accounts provide a valuable emic and oral historical perspective on the phase and direction of settlement of Isabel. Migrations and the displacement of villages that occurred as a result of head-hunting in the last few centuries in Isabel are discussed in section 4.2.

Bogesi also provided insight into migratory movements in Isabel through descriptions of the organisation of totemic clans in the province (1948: 213). He described that, apart from Kia whose people were sub-divided into twelve sub-clans ('*toba*'), there were three major clans in Isabel: Vihuvinagi (eagle), Posomonggo (red parrot) and Thonggokama (frigate bird). The Thonggokama clan, which differed from the other two clans by being a Ngella word meaning 'high chief', Bogesi postulated is likely to have originated east of Isabel in the Florida Islands as is supported by a tradition of immigrants from Florida settling Bughotu (Bogesi 1948: 214). Today, the clan system has disintegrated across most of Isabel, and White (1978: 60) has attributed this to a disruptive period of head-hunting raids in addition to Christianisation and other social and cultural changes which have devalued the importance of genealogical knowledge.

In parallel with what has been documented about Isabel cultures, ethnographic recordings about migrations and origin stories of Choiseul people are limited. The few texts which expand upon this include Harold Scheffler's doctoral research (1965a), an emic account written by Guso Piko (1976), ethnographic notes taken by Richard Thurnwald (1912) and Arthur Capell (1943), and writings by Methodist missionaries Stephen R. Rooney (1912) and John R. Metcalfe (1937). Scheffler's research, which he conducted over 18 months between 1958 and 1961 in the Varisi district of northern Choiseul as part of a PhD with the University of Chicago, remains one of the most comprehensive ethnographic studies of Choiseul to date[5]. In his description of "Choiseulese" origins, he stated that "unlike the Simboese"', who he had also lived with and described (Scheffler 1962), "they (Choiseulese) have no historical or mythological traditions concerning the whole population and very few concerning the origins of its lesser social units" (1965a: 9). Moreover, he asserted that "it would appear that 'migrations and movements' can refer only to very recent and small-scale ones, such as from 'bush' to 'beach'…" (*Ibid*).

Guso Piko, who was born in 1907 in the Avaso language region of southeast Choiseul and was one of Solomon Islands' first Assistant Native Medical Officers, proposed a possible point of origin for Choiseul people. In a minor note within an article he wrote about traditional currencies of Choiseul (Piko 1976: 110), Piko stated that he "believed… Laena Island must be the original place of the people of the Avaso or perhaps the Choiseul people in general". He did not give a specific reason for this nor did he expand upon mythological stories associated with Laena Island. But it is implied from his writing that his view was based on evidence of noticeable antiquity of human occupation on the island as demonstrated by the presence of grinding stones which "were hollowed due to long use" and "tombs" and "high stone walls… still standing there" (*Ibid*). Radiocarbon dating of Laena Island is described in Chapter 5.

Rooney, who was the first permanently based missionary on Choiseul (McDonald 2009: 45), described a creation story, albeit what appears to be a highly Christian-influenced version, from villagers in Sasamungga in central Choiseul. He wrote that "these people believe in a Great and Good Spirit… "Bangara la'ata".. [and] to him they give the credit of making the world and all that is therein. In addition…, these people believe there are

[5] In addition to his thesis (1965a), which examined the formation and operation of ambilineal descent in Choiseul, Scheffler also wrote several articles about the important socio-cultural role of conflict in Choiseul (Scheffler 1964a, 1964b), and about the traditional currency, *kesa* (Scheffler 1965b).

several minor gods, who with their great chief live on all reefs and outstanding rocks in the water" (Rooney 1912: 445). Rooney also described that after death, spirits travelled to a place called "*Vudu ni Vungini* (the abode of spirits, or the spirit world)" (*Ibid*). Capell (1943: 25) expanded upon this, describing that "souls were believed to go to a volcano near Numanuma, Bougainville… called 'vundu ni vuyani'". Similarly, Scheffler wrote that "all *manuru* ("spirits") of a group, good and bad, returned to its village to escort the new *manuru* to Ungana, the land of the dead somewhere high on Bougainville Island" (1965a: 248). Overall, these accounts of origin stories from Choiseul parallel Bogesi's account of Isabel peoples 'arriving from the west'. But in the case of Choiseul, ties were made specifically with Bougainville as acting as a point of return for human spirits. Oral histories of the origins and migrations of people in Choiseul and Isabel are also linked with the development of trade and exchange networks in these regions.

4.1.2 Trade and Exchange Networks

The most detailed ethnographic accounts of trading systems in the Western Solomons come from research undertaken on Simbo and parts of the New Georgia group (Rivers 1914; Hocart n.d.; Itoh and Chikamori 1965). Chikamori, who spent part of his anthropological tour of the Western Solomons in Vella Lavella, remarked that "present networks of trading in this region are very intensive" (Itoh and Chikamori 1965: 25). He was commenting mainly on a highly active local network of exchange between Vella Lavella, Simbo, Roviana, Ranongga and other communities in the New Georgia group (Figure 4.1).

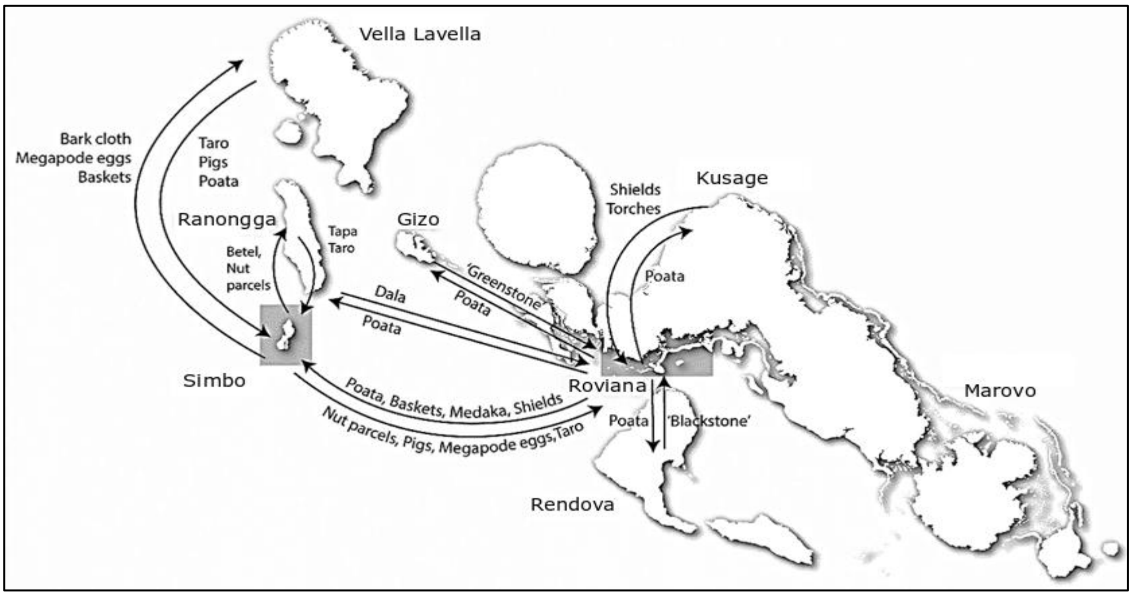


Figure 4.1 Examples of Simbo and Roviana trade partnerships documented in the New Georgia group (figure from Thomas 2019: Fig. 7.2, originally based on Hurford 2017: Map 3.4).

This network, Chikamori recorded, also branched out and encompassed Isabel, Choiseul, Shortland Islands and Savo. For example, he described that "Paramata Village in Vella Lavella exports dried nuts and lady's rain hats of pandanus to Simbo, Munda and [R]anonga, and imports rattan shields, shell bracelets, kerosene and wooden bowls for pudding from Munda, shell coins from [R]anonga and cloth of wood fibre from Santa Isabel" (Itoh and Chikamori 1965: 25). Similarly, British anthropologist Anna Craven (1976) wrote in unpublished field notes that decorated wicker shields were bought and prized by Choiseul people or won in war from Vella Lavella and Roviana. Hocart (n.d.) described Roviana as a "manufacturing district" and recorded that trade within the New Georgia group typically operated through the exchange of food and shell rings called *poata*. He wrote, "Foreign [inter-island] trade has two branches: *taku* and *nggave*; the distinction is between purchase of food and purchase of manufactured articles… [such as] rings, tapa, armlets, etc." (Hocart n.d.: 22).

Outside of what has been documented ethnographically in the New Georgia group, little has been recorded about networks of exchange that existed on Isabel. Ceremonies of exchange, namely the hosting of feasts which involved reciprocal gift-giving of food and shell valuables, are the most well-described forms of socio-economic exchange that have been documented in the province (White 1978, 1991; Whiteley 2015). In addition to holding feasts, the launching of head-hunting raids facilitated opportunities for economic interaction and for chiefs to engage in reciprocal exchange to establish social ties and reinforce alliances (White 1991: 83). Guns and tomahawks were highly prized for their use in head-hunting raids, and their demand grew following the intensification of contact between Europeans and indigenous communities in the Western Solomons in the 1800s. White (1991: 87) described that the more seagoing peoples of Kia and Bughotu were able to take advantage of this and dominate Cheke Holo speakers dwelling inland who participated very little in European trade and labour recruiting. These coastal communities, in contrast to swidden agriculturalist communities living inland, he described, were "relatively sophisticated maritime peoples… accomplished in constructing canoes, making nets, fishing and hunting turtle" (White 1978: 56).

Other evidence of trade occurring between communities in Isabel and other provinces are only made brief references to in the ethnographic literature and can be summarised as follows. The importation of pottery to Isabel, most likely from potting centres in Choiseul, is evident as early as the mid-1500s. During Mendana's voyage, it was observed at a village on San Jorge Island that there were "many large canoes, and two very thin jars of clay… the Indians said they had brought them from another land far off" (Amherst & Thomson 1901: 173). There is also evidence of the trade between communities in northwest Isabel and Ontong Java occurring in the latter half of the 1800s and as early as the late 1700s (Fleurieu 1791: 143). Guppy (1887: 33) documented that it involved ten to twelve-day long voyages and the exchange of captured men or slaves for tapa.

In southern Isabel, which shares close linguistic and social ties with nearby Ngella inhabitants, there is evidence of the region forming part of a regional exchange network with north Malaita, east Guadalcanal and Makira (Penny 1887; Hogbin 1964). Hogbin (1964: 50) mentioned, for example, that "the natives of Florida are the middlemen for the clamshell and turtle shell ornaments manufactured on Isabel". He did not explain in any more detail the role of Isabel communities in the exchange network, although Penny (1887: 86) wrote that "when a sufficient quantity [of shell money] is prepared, a trading party sets out for the Floridas, Ysabel or other islands to buy food". White (1991: 60) described that traditional shell valuables created from giant clam shell and porpoise teeth were primary items of exchange between Isabel chiefs. Dog teeth necklaces made on Isabel were also exchanged and used as a currency within this regional trade network (Codrington 1891: 325). Another trade item manufactured in Bughotu were plank-built and ornamented war canoes, locally called *biabina*. Woodford recorded that the building and sale of *biabina*, which "was the same type as in Savo, Florida and Guadalcanal", provided the "natives of Ysabel good business… [with] natives of neighbouring islands" (1909: 514).

In a short summary of trade and exchange practices in Choiseul, Scheffler (1965a: 26) wrote that "there seems to have been a small but not highly specialized trade between coastal and inland settlements, though today there is little knowledge of it". People living on the coasts, he wrote, "were first to be contacted by Europeans, and those in Babatana (Mbambatana) had the advantage of being, for a time, the only ones visited with any regularity by European traders" (*Ibid*). In northwest Choiseul, Henry B. Guppy, naturalist and medical doctor who travelled on H. M. S. Lark in the Northern Solomons in 1882, observed that there was an extensive and very active network of interaction in Bougainville Strait. It was facilitated primarily by chiefs of the major islands: Gorai from Shortland Island (Alu Island), Mule from Treasury Island, Kurra-kurra and Tomimas from Faro Island, and Krepas from Choiseul Bay (Guppy 1887: 20). Guppy described that, particularly in the Shortlands group, “there is constant communication between the natives of these islands… and intermarriages are frequent” (*Ibid*).

Other ethnographic accounts that have provided insight into trading activity in Choiseul have been confined to the northwest end of the province and have centred mainly on the production and marketing of pottery. In 1964 during a visit to Chirovanga in northwest Choiseul, Chikamori briefly recorded an extensive inter-village trade network involving the exchange, among other things, of pottery and shell valuables (Figure 4.2). He wrote that “the people of Burango (Vuranggo), Tamabato (Tombarato), Singa (Sengga), Kokonengo, Kandova and Koroe (Koloe) come to the colony (Chirovanga) to buy pottery. The people of Sasamungga and Malagano also came there in the past” (Itoh and Chikamori 1965: 15). Small clay pots, Chikamori described, were traded for three *kesa* and large ones for five *kesa*. British anthropologist, Anna Craven, documented the same trade network centred at Chirovanga a decade later while surveying northwest Choiseul as part of her research as curator of SINM. She wrote that clay pots were “sold in market; people come from other villages [including] Taro, Choiseul Bay, bush villages, Bobokuana (Varisi), Vuranggo, Kokonengo” (Craven 1976: 2). She recorded the prices of the pots in Solomon Islands Dollar as follows: “large $10; medium $6 and $8; small $2” (*Ibid*).

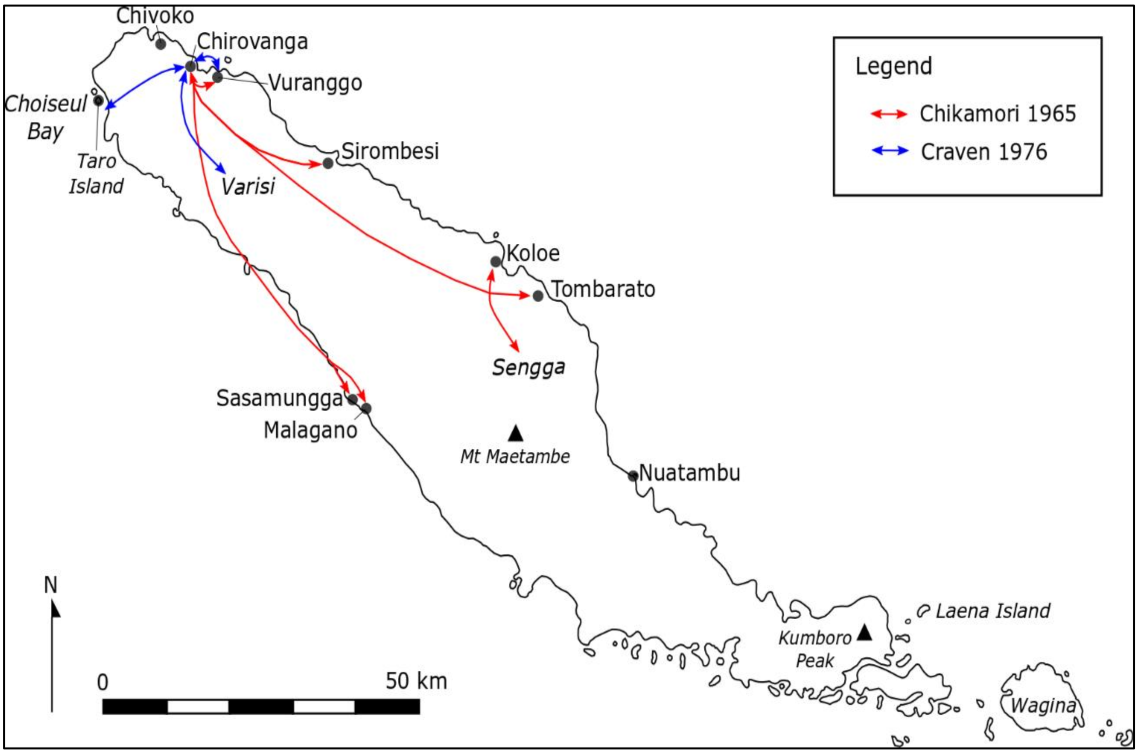


Figure 4.2 Ethnographic trade patterns of pottery between villages in northwest Choiseul (created using descriptions by Itoh and Chikamori 1965 and Craven 1976).

Overall, ethnographic descriptions of trade patterns involving Isabel and Choiseul demonstrate evidence of regional networks of interaction in northwest Choiseul, the Manning Strait region and in southern Isabel that occasionally overlapped although principally operated independently from one another. Further evidence of these interaction networks is given in the next section but with a focus on examining regional differences and similarities in shrine construction and burial practices.

4.1.3 Shrines and Burial Practices

Shrines and burial practices are a common feature of Melanesian ethnographies (e.g. Codrington 1891; Rivers 1914; Hocart 1922; Oliver 1967), and thus serve as a useful point of comparison between regions to assess spatial and historical patterns in their cultural development. In the Western Solomons, the most comprehensive ethnographic accounts, namely books and unpublished notes by Hocart and Rivers, have been written about Roviana and the wider New Georgia group. Previous archaeological and ethnohistorical studies have taken advantage of this to explore processes of cultural interaction between communities in the New Georgia group (Nagaoka 1999; Sheppard *et al*. 2004; McKenzie 2007; Thomas 2009, 2014; Hurford 2017) and in the wider Solomons (Walter and Sheppard 2017: Chp. 2). This section takes a similar approach but places emphasis on examining shrine construction and burial practices in Isabel and Choiseul. The remaining paragraphs review ethnographic writings of these traditions and compare regional differences in burial practices in Choiseul, specifically the practice of cremation and the construction of stone monuments called *dolo* which are unique to the northern half of the province (Craven 2019).

White (1991: 33-43) has provided one of the most detailed descriptions of *sara* ('shrines') in Isabel, specifically of a shrine complex in an area of Maringe named Knabu after the people who settled there sometime in recent history. He described visiting a sacrificial altar, constructed of "flat stone slabs", where human victims were sacrificed and their skulls were stored as a "visible testimony to the strength of the Knabu people" (1991: 37). Shrines, he described, acted as "central places for regional ceremonial activity" as was indicated by the presence of a former dance ground and ceremonial house near the shrines. Knabu chiefs were described to White to have periodically invited neighbouring chiefs "from east and west" to gather with their followers for feasting, ritual exchange as well as singing and dancing (White 1991: 40). He wrote also that shrines symbolised genealogical connection of residents to the lands centred around the site and that the naming of a shrine, such as the Knabu shrine, was powerful as it served as both an index of ancestral lands and an emblem of descent group identity (*Ibid*: 37).

Other descriptions of shrines in Isabel have been given by Miller (1979) and by researchers involved in the MABO Project, a joint anthropological documentary project between Osaka University and SINM initiated in the mid-1990s. In Bughotu, Miller (1979: 24) described three different types of shrines: 'landmark' shrines which represented the place of the first settler, sacrificial shrines and garden shrines. In the Kia District, MABO researchers recorded a spatial and socio-political division between the internment of the bones of chiefs and prominent leaders and those of enemies. They wrote that "skulls and bones of… leaders of the society are secretly kept in their *beku* burial shrines inland", while the "bones of captured enemies are kept in *sara* burial shrines along the coast" (MABO 1996: 6). *Beku*, in this context, refers to a common form of burial in the Solomons archipelago where corpses were set up in a squat or seated position with elbows resting on knees and hands under the chin[6] (Hocart 1922; Capell 1943; Thomas 2009: 186).

Similar accounts of shrines and burial practices have been given in Choiseul (Capell 1943; Scheffler 1965a), although, unlike in Isabel, there is a noticeable geographic distinction in burial practices between northwest and southeast ends of Choiseul. Ethnographically, this distinction is demonstrated by consistent descriptions of cremation being either solely or dominantly practiced in Buin, southern Bougainville, and also being practised in Shortland Islands and northwest Choiseul (Thurnwald 1912: 27; Rivers 1914: 268; Capell 1943: 24; Oliver 1967; Craven 2019). For example, in Shortland Islands, Wheeler recorded three methods: cremation, which was usually reserved for chiefs and other high-status men and women, burial in the ground, and interring bones or ashes in the sea or into rivers (see Rivers 1914: 268). In northwest Choiseul, cremation appears to have been practised in conjunction with the construction of *dolo* which were monolithic, typically cylindrical burial caskets carved from stone (Figure 4.3). In a similar manner to shrines, *dolo* burials were closely bound to land rights and acted as makers of areas that belonged to descent clans (Craven 2019: 29).

[6] '*Beku*' can also refer to carved images and idols based on this seated position and human or animal prototypes which are common throughout much of Solomon Islands (Waite 1979; Thomas 2009).

Figure 4.3 Dolo at the site of Koivavuka, northwest Choiseul. (Image: Craven 2019: Fig. 22).

Another method that appears to have been confined to, or at least was more dominantly practised in the northwest end of Choiseul was the interment of human skulls in clay pots. Craven (2019: 38) observed "several sites where single or clusters of locally made pots containing cremated bones had been placed" during her surveying in the vicinity of Chirovanga in 1976. She described that for each *dolo* site, "there was an equivalent but separate site for the pots of bones of women, and for less important men, protected by a cover of stone or coral slabs" (2019: 32). This method has been documented to have been practised as far south as Ogho near the centre of Choiseul (Figure 4.4), but otherwise is unique to most of the Western Solomons. Overall, the geographic distribution of these burial practices in Choiseul demonstrate evidence of closer cultural and historical ties between the northwest end of the province and southern Bougainville and Shortland Islands. Whereas southeast Choiseul appears more culturally connected to the nearby islands of New Georgia and Isabel. This is discussed in more detail at the end of the chapter.

Figure 4.4 Coral chamber shrine with pot and skull inside. Photographed by Scheffler in Butubutu near Ogho, Choiseul. (Source: https://library.ucsd.edu/dc/object/bb02057587).

4.1.4 Discussion

Two points of discussion can be raised from the review of the ethnographic literature. The first is centred upon tracing ancestral homelands of Choiseul and Isabel inhabitants and the second on deliberating the development in late prehistory of three important regional networks or spheres of interaction in the main Solomons. Interpretations and arguments made in this discussion are done so with the intention of addressing the research questions set out in Chapter 1. It is important to highlight, however, that these are preliminary and will be expanded upon in Chapter 10 after existing archaeological evidence has been reviewed and new archaeological findings presented.

Comparing the origin and migration stories documented for Choiseul and Isabel peoples, there is a clearer pattern of historical movement and settlement interpretable for the latter. Bogesi's account, which is valuable as he recorded in a satisfactory amount of detail *kastom* knowledge from major cultural-linguistic groups located at both ends of Isabel, provided a rather uniform sequence and direction of human settlement. The earliest populations, he described, came 'from the west' and settled at a place called Vulega located on Barora Faa and Barora Ite Islands in northwest Isabel before moving onto the mainland and branching out to settle the densely populated parts of the province. This was supported, Bogesi explained, by the common belief that "after a person's death a spirit has 'gone west', i.e. *horu i tuhilagi*, pointing to the fact that the ghost returns to the place where the people originally came from" (1948: 208). A placed called Moumolu located on San Jorge Island, he wrote, is believed "by some" in Bughotu to be the site of *tuhilagi*, which would suggest San Jorge Island as a possible early site of occupation for the southern Isabel region.

Documentation of clans in Isabel provide further evidence of historical movements of people as well as the formation sometime probably in the last millennium of social ties between southern Isabel and Ngella. This is exemplified by Bogesi's description of one of the three major clans in Isabel, the Thonggokama clan, which originated in Ngella and was brought to or adopted in Bughotu following a period of immigration of people from Florida to Bughotu. An element of time depth may also be extracted from examining clan histories. In northwest Isabel, this is indicated by the considerable divergence of Kia peoples into twelve *toba* or sub-clans whereas Bogesi describes no subdivision of the remaining clans. A higher divergence of clans in Kia correlating to a greater length of human occupation would support Bogesi's description of northwest Isabel as the first point of arrival of people to Isabel. In contrast to Isabel and parts of the Central Solomons including Guadalcanal and Ngella, clan histories are unfortunately less well-recorded in Choiseul and are therefore less reliable for investigating its settlement history.

Accounts written about the origins of Choiseul people give a murkier narrative compared to Isabel. In the northwest end of the province, ethnographic descriptions of religious beliefs and the movement of spirits after death illustrate close ties to Bougainville (Scheffler 1965a; Rooney 1912; Capell 1943). While in the southeast end, Piko (1976) suggests Laena Island as the birthplace of Avaso-speaking people and possibly the whole of Choiseul. From my conversations with elders and chiefs in Rokoso and Nuatambu, it was clear that collective memories and individual recollections of migrations stretched back to no earlier than the last few hundred years. Their knowledge was particularly insightful for learning the whereabouts of 'old villages' inhabited during times of head-hunting, one of which was visited (Appendix A: ROK-1). Furthermore, my informants highlighted to me important historical ties between Laena Island and Nuatambu centred upon the mythological creation of kesa and voyaging along a coral reef 'road' that stretched between these islands. Further evidence of interaction between these islands is presented in Chapter 7 in the presentation of findings from the compositional analysis of pottery collected in Manning Strait.

Summarising the ethnographic documentation of trade and exchange patterns in Choiseul and Isabel, the most extensive and active trade networks in Choiseul appear to be confined to the northwest end of the island. In the late 1800s, this was centred around "an extensive and very active network of interaction in the Bougainville Strait" that involved chiefs from Shortland Islands and Choiseul Bay (Guppy 1887: 20). Additionally, in the 1960s and '70s, Chikamori and Craven recorded a gradually diminishing intra-island trade of Chirovanga pottery (Itoh and Chikamori 1965; Craven 1976). Isabel, on the other hand, is depicted as possessing two core areas of trade, one in the northwest end of the province involving Zabana-speaking coastal communities within the vicinity of Kia and the other in southeast Isabel in the Bughotu region. In northwest Isabel during the late 1800s, Guppy (1887: 33) noted evidence of long-distance voyaging to Ontong Java to exchange captured slaves for tapa. In southern Isabel, there is evidence of more intensive interaction occurring over the last several centuries between Bughotu and Ngella communities centred upon intermarriage, migrations and the trading of food and *biabina* canoes among other items (e.g. Woodford 1909). This sphere of interaction overlapped with a larger regional exchange network, the 'Eastern Triangle', described by Hogbin (1964) and Penny (1887) in the Central Solomons that involved Malaita, east Guadalcanal and Makira.

Spatial and historical patterns of these interaction networks also mirror the geographic distribution and sharing of traditions of shrine construction and burials in the Western Solomons. Specifically, cremation, the construction of *dolo* and the use of burial jars in northwest Choiseul reflect its close cultural ties with Shortland Islands and southern Bougainville. While the prevalence of *beku* and skull shrines in southeast Choiseul, the New Georgia group and Isabel are testament to more frequent social interaction between these regions that intensified particularly following the development of Roviana-led head-hunting raids into the Manning Strait region in the nineteenth century. Overall, the structure of the sharing of these cultural traits and the location and extent of the various regional networks of interaction relate closely to the proximity between the islands (Terrell 1997ab) (Figure 4.5). Superimposing over Terrell's nearest-neighbour diagram the approximate geographic extent of the spheres of interaction described above demonstrates its effectiveness in modelling the development of interaction in the main Solomons during late prehistory. In Chapter 10, processes of regionalisation of networks of interaction in the Western Solomons are discussed in more detail. Integrated in this discussion are the findings from the fieldwork carried out in Manning Strait and ceramic analyses which shed further light on the production and movement of pottery in the region within the last millennium.

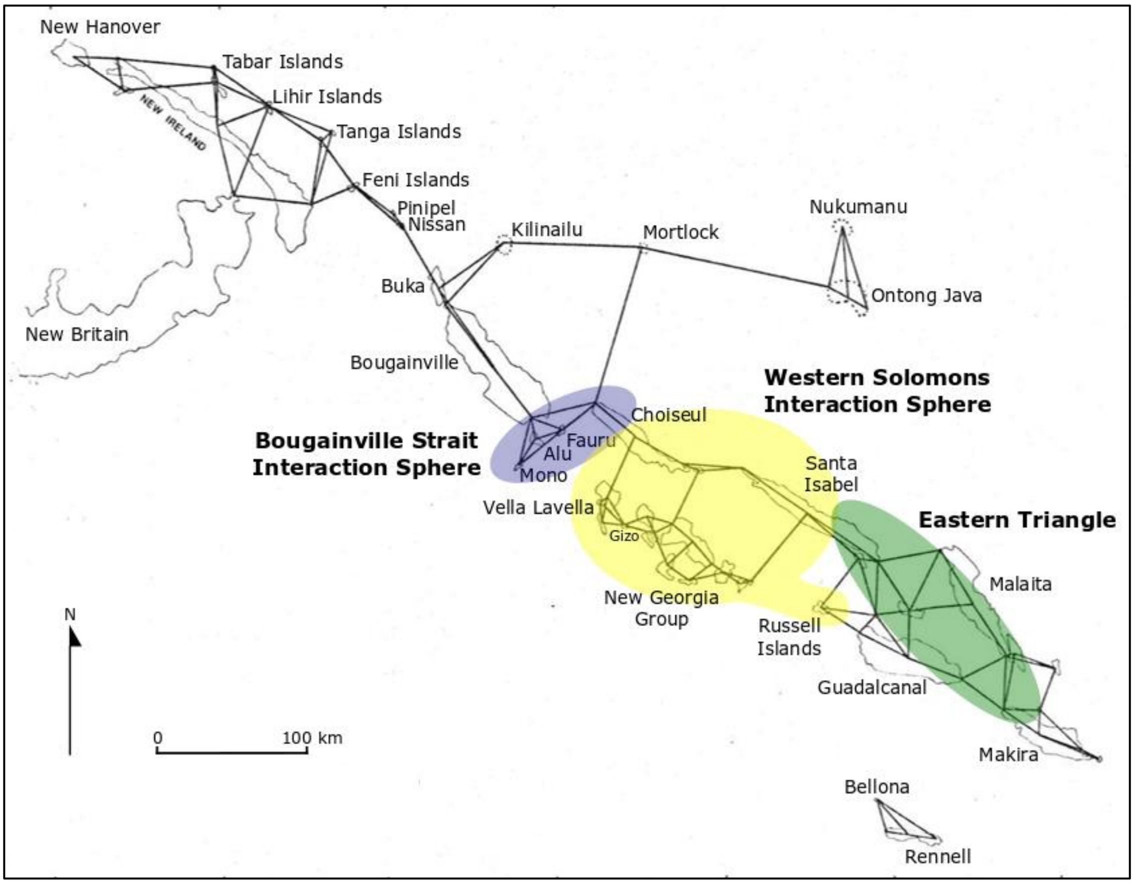


Figure 4.5 Nearest-neighbour model in Solomon Islands superimposed with historically recorded regional spheres of interaction in main Solomons (adapted from Terrell 1976a: Fig. 6).

4.2 Contact History

This section is a review of early historical accounts and modern historical literature written about the Western Solomons, with emphasis placed on writings about Isabel, Choiseul and Manning Strait. The section is structured in three parts. The first is a review of some of the earliest documented encounters European exploration parties made with Solomon Islanders with preference given to those that provide insight into cultural practices, settlement patterns and population distribution. The second and third parts examine head-hunting, warfare and Christianisation which are depicted as key historical phenomena by historians, and archaeologists alike, in the study of Western Solomons' history. These phenomena are examined primarily with a focus on delineating impacts made upon Choiseul and Isabel peoples and their cultures, as well as patterns of settlement distribution, mobility and trading.

4.2.1 Early European Encounters

The first encounter between Europeans and Solomon Islanders occurred with Mendana's first voyage and discovery of the *Islands of Solomon* in 1568. Following this, about a dozen subsequent European voyages are known to have made contact with or at least sighted the island archipelago from the mid-1500s to late-1700s (Jack-Hinton 1969). These include Mendana's return voyage in 1595 with Portuguese chief pilot, Pedro Fernandez de Quiros, during which they discovered and made landfall on Santa Cruz Island. They failed to establish a colony there which was made unsuccessful mainly by Mendana's death and not long after arriving, Quiros and the remaining crew vacated the island. Quiros returned to the Solomons in 1606 and mapped Taumako and Tikopia.

The main Solomons archipelago was not revisited from the time of Mendana's first voyage until a surge in rediscovery and more deliberate exploration of the Solomons that occurred in the 1760s. This was spearheaded by British naval officer, Philip Carteret, and French explorers, Louis-Antonine de Bougainville and Jean Francois de Surville. Other notable European expeditions that occurred at this time included La Perouse's ultimately fatal rediscovery of Vanikoro in 1788 and, in the same year, Shortland's voyage back to England after the successful establishment of Port Jackson in Australia during which he passed near Simbo and through Bougainville Strait. The following paragraphs describe encounters experienced by European explorers in the Western Solomons. The encounters are derived from secondary accounts of Mendana's first voyage (Amherst and Thomson 1901), and voyages made by Bougainville, Surville and Shortland in the late 1700s (Fleurieu 1791). For a more comprehensive examination of early colonial and exploratory voyages to Solomon Islands, see Jack-Hinton 1969.

Amherst and Thomson's (1901) translation of Spanish manuscripts written during Mendana's first voyage to Solomon Islands in 1567-1568 provides one of the most detailed accounts of an early encounter between Europeans and Solomon Islanders. The source is particularly useful for an examination of Isabel, as this is where the explorers first made landfall, specifically at Estrella Bay located on the northern coast of central Isabel. The crew spent about six months in the Solomons archipelago visiting the Florida group, Guadalcanal, Makira and sighting Malaita and Choiseul on a brigantine which they built over three months at Estrella Bay. While stationed in Isabel, the descriptions given by Mendana and other crew members including chief pilot, Hernando Gallego, and designated cosmographer, Pedro Sarmiento de Gamboa, demonstrated that sizeable populations were living inland as well as on the coast of the island during the mid-1500s. Gamboa, described that after "journeying for about six leagues [inland from Estrella Bay]… [his party] camped that night upon a height… seeing that along the banks of the river, and about all the country within sight, there were many Indians" (Amherst and Thomson 1901: 168). Another exploratory party who travelled by foot about 20 km west of Estrella Bay did not report encountering any large villages. Although Mendana's crew were met by a *tauriqui* (meaning 'chief' in Cheke Holo) "who called himself Bene, whose territory lay to the west of the island" (*Ibid.* 170). Mendana described that Bene, who most likely travelled from the Kia region, "arrived with fifteen canoes full of men, well provided with arms, and he sent me a quarter of human flesh which seemed to be that of a boy, with some roots of *vinahu* (taro), saying to me in his language to eat it" (*Ibid*).

The mainland southeast of Estrella Bay and particularly San Jorge Island were also described as well-populated. Sarmiento, who made landfall on San Jorge Island and is recorded to have seen numerous large canoes and two clay pots, was informed of but strictly never permitted to meet a reigning head chief, called Benebonefa, who resided on the island. Two other chiefs Mendana's crew met at Estrella Bay - the local chief, Bilebanara, and his neighbouring chief most likely from the Maringe/Bughotu area, named Mate - are portrayed in the texts to have both admitted some sort of suzerainty in Benebonefa. White (1991: 83) has commented on this, suggesting that "some of the patterns of power and meaning embodied in chiefly leadership today were also evident then". Today, San Jorge Island is virtually uninhabited, and the disappearance of the once sizeable population observed there by Sarmiento is attributed by Amherst, who had received advice from the District Commissioner of British Solomon Islands Protectorate (BSIP) at the time, Charles Woodford, "to head-hunters from New Georgia [raiding the region] during the present generation" (Amherst and Thomson 1901: xxxi).

After Mendana, almost two centuries past before another European explorer reached the main Solomons archipelago. This was done in 1768 by M. de Bougainville who was most famous for his exploration and chartering of part of Bougainville as well as the discovery of a passage located at its southern end, also credited with his name. His crew never made landfall on Choiseul although his descriptions, which were mainly of a brief and exclusively violent encounter with its inhabitants, do provide some insight into their behaviour, material possessions and settlement in the region. Bougainville wrote that upon entering the passage, his party looked to make landfall near Choiseul but were prevented by a deluge of rain and a strong current. Consequently, he sent out armed boats to examine a "fine bay which promised good anchorage" (Fleurieu 1791: 93), which they gave its still existing name, Choiseul Bay.

The banks of the river in Choiseul Bay, Bougainville described, were "covered with huts" and the "peninsular to the north, [was] entirely covered [with] cocoa-nut trees" (*Ibid*: 95). When the exploratory team entered the bay, they were affronted by a large group of canoes which Bougainville, may have exaggeratingly, recorded as consisting of "one hundred and fifty men, armed with bows, lances, and shields" (*Ibid*: 94). The group impressed Bougainville as they "advanced in good order" during their attack but were eventually routed after a few musket volleys (*Ibid*). Two canoes were captured by the European crew and Bougainville wrote that within the canoes, they found "bows, arrows in great numbers, lances, shields, cocoa-nuts, and other fruits of kinds unknown to us; areca, leaves of betel, lime, small implements used by these Indians; nets, with very fine meshes artfully woven, and the jaw of a man half broiled" (*Ibid*: 95). Ultimately, following this encounter, Bougainville surmised that the "courage [of the Choiseul group] in attacking us, their custom of carrying arms, both offensive and defensive, and their skill in using them, prove that they are almost always in a fate of war" (*Ibid*).

A similar account of war-like inhabitants is given by Surville who reached northwest Isabel in 1769 and anchored for over a week in a sheltered harbour located near the northwest end of Barora Faa and eastern edge of Ghaghe Island, which he named Port Praslin (Fleurieu 1791: 202). Journal notes written by Surville's second lieutenant, Jean Pottier de l'Horme, provide the most detailed descriptions of their time in Port Praslin and of the Isabel inhabitants (Dunmore 1974). Initial encounters with the local inhabitants were depicted as cordial as many of Surville's crew were ill and in desperate need of drinking-water when they arrived there, thus desired to gain the favour of the local populace. This changed abruptly, however, after a small water-gathering party who were guided by one of the locals from the ship to a spring on Barora Faa were attacked and incurred wounds from launched arrows and stones. The party were described to have been rushed as they were boarding their boat by "more than two hundred and fifty islanders, armed with lances of seven or eight feet long, swords or clubs of wood, arrows, and stones, and some with shields…" (Fleurieu 1791: 120). Following the incident, the crew interacted very little with the local inhabitants and, ultimately, inspired Surville's naming of the region as the *Isles of the Arsacides* ('Islands of the Assassins').

The remaining duration of Surville's anchorage in Port Praslin was spent building freshwater and firewood supplies which the crew were able to achieve with the aid of a local teenage boy Surville captured and had serve as a translator. The boy, whose name they understood to be Lova Saregua and who was kept captive until the ship returned to Europe, was adept at learning French and informed the crew most of what was recorded about 'native' life in the journal accounts. Surville's crew, who never entered the island interiors, witnessed "no building better than fishing huts [in Port Praslin]". Lova asserted, however, that considerable villages were located inland on the islands (Fleurieu 1791: 144). From examining Pottier de L'Horme's notes and a map of Port Praslin drawn during Surville's voyage (Figure 4.), it is difficult to ascertain exactly which islands in northwest Isabel were inhabited. The coastline of the northern Isabel mainland is not described to be inhabited, and it is likely the greatest concentration of settlement in this part of Isabel at this time was on Barora Faa and surrounding islands.

Surville's crew also observed no cultivated land but described seeing groves of planted fruit and nut trees including coconuts and assortments of almonds (*Canarium* sp.). Lova also provided some insight into chiefly authority and the influence chiefs had on the production and circulation of food and other goods. The crew interpreted from Lova's explanations that: "the authority of the king or chief… is unbounded; all his subjects are obliged to carry to him the produce of their fishing, the fruits they have gathered, the works of their hands, and the booty taken from their enemies: the king retains what he wants and restores the rest to the proprietors" (Fleurieu 1791: 140). It was explained also that refusal to honour the chief could result in death, although if this was committed by a person of high status who had "possessions of great value", he may be able "obtain pardon by the sacrifice of his riches" (*Ibid*).

Figure 4.6 Map of Port Praslin drawn during Surville's 1769 anchorage (Fleurieu 1791: Plate IV).

No more encounters were documented to have been made with Isabel and Choiseul inhabitants until an increase in whaling and trading activity in the Western Solomons in the nineteenth century. Shortland, however, made a brief encounter with men from Simbo in 1788 as he and his crew, including first Governor of New South Wales, Arthur Philip, returned to England after having founded a settlement at the site of modern-day Sydney. Governor Philip wrote that they "willingly exchanged a kind of ring which they wore on their arms; small rings of bone, and some beads of their own manufacture for nails, glass-beads, and other trifles; giving, however, a manifest preference to whatever was made of iron" (Fleurieu 1791: 191). The Simbo inhabitants were also described as having "dealt very fairly, not betraying the least desire to steal or defraud" (*Ibid*). Significantly, the account described one of only a few peaceful encounters Europeans had with people of the *Arsacides*. This was a rare exception to a reputation that had manifested over the late eighteenth century amongst British and French explorers and traders who entered Solomon Islands of the archipelago possessing few commercially exploitable products and posing an important risk in the form of its resident savages and cannibals (Bennett 1987: 24).

4.2.2 Head-hunting and Warfare

Following an era of occasional contacts with European explorers and merchant ships, the nineteenth century is portrayed as an important turning point in Solomon Islands' history (Bennett 1987). In the Western Solomons, the first few decades of the 1800s was marked by a considerable rise in contact with European whalers who used the region as an ocean highway into the South Seas as Atlantic whaling grounds became exhausted (Bennett 1987: 24). Sheltered harbours that had reputations for being safe for white men, such as Simbo, were also used as pit-stops by whalers where supplies of wood and water could be replenished and women could be sought. From the 1840s, with the arrival and settlement in the region of the first traders and later in time the first Christian missionaries and British colonialists, there was much greater movement towards Western commerce and culture being integrated into traditional societies and existing trade networks (Jackson 1975).

The nineteenth century was also made significant by an intensification of head-hunting which was fronted by chiefs and raiding parties from Roviana who had begun dominating trade with Europeans and gaining access to tomahawks and other iron trade goods (Sheppard *et al*. 2000). Prominent authors on the head-hunting tradition in the Western Solomons, Walter and Sheppard, argue that it was "a key component of a ritually charged politico-economic and religious system that evolved in a regionally distinctive form in the New Georgia Group during prehistory" (2017: 139). Central to this system, they explained, were ancestor cults, the war canoe (mon-type plank-built canoes) and canoe houses as sites of male power, the circulation of bakiha and other shell valuables, and head-hunting as a source of material wealth and mana (Figure 4.).

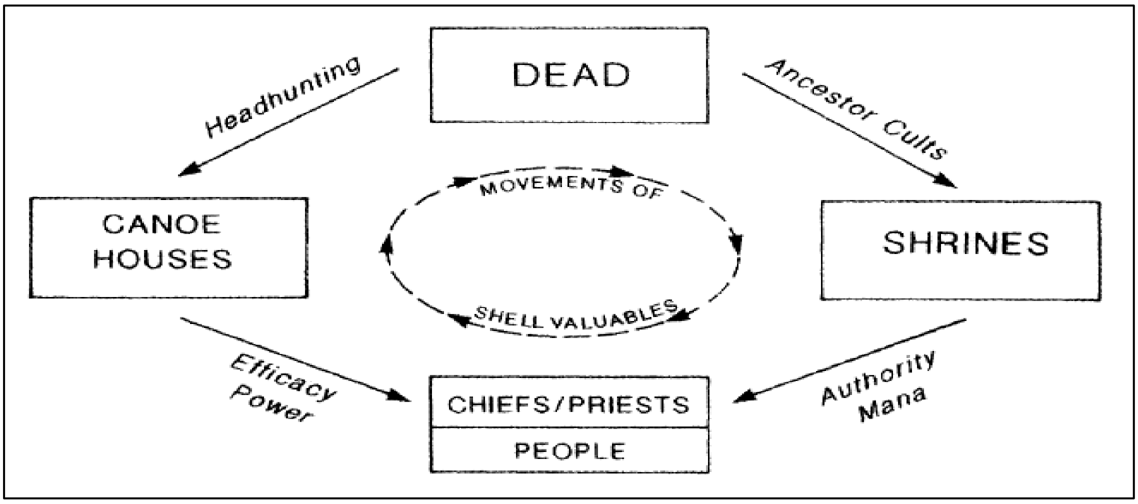


Figure 4.7 Representation of materialised power relationships articulated within head-hunting tradition. (Source: Sheppard *et al.* 2000: Fig. 3).

Exactly when in prehistory head-hunting began is not known, although, as was described previously, there is evidence of canoe-travelling parties of warriors, human dismemberment and sacrificial offerings as early as when Mendana arrived in the mid-1500s. The tradition of head-hunting more formally recognised in the Western Solomons, which was documented in detail from the 1840s, involved independent or inter-communal raids which took place over a few weeks or several months for the collection of heads which would be returned and displayed in canoe houses. Raids were conducted predominantly by chiefs from Roviana and the wider New Georgia group, and by at least the 1850s by chiefs also in the Kia and Bughotu regions of Isabel and in northwest Choiseul (MABO 1994, 1996).

Before Christianisation, fighting is recorded in Choiseul to have occurred internally between clans as well as externally with Vella Lavella (MABO 1996: 15). Battles are also recorded to have taken place around Manning Strait between Choiseul groups and head-hunting parties from Barora Faa in northern Isabel and from the New Georgia group. For example, Craven was informed that Susuka village from northern Choiseul “waged a war in Wagina against Roviana (Munda) people” (1976: 23). Additionally, Bogesi described head-hunters from Barora Faa had attacked Laena Island where “the people lived on top of a rock fortress” (1950: 3/4). On their return voyage, he described that, the Barora men “met a convoy of canoes from Roviana, Kolombangara, Vella Lavella, etc. awaiting to give chase” (*Ibid*). During head-hunting raids, men, women or children captured were taken as slaves, although were not always treated as such and were customarily adopted into conquering communities. Allan (1988: 22) described in

Isabel that there were two classes of 'slaves'. The first class consisted of those captured outside Isabel who belonged to the primary and sub-clan of the captor from whom land rights were derived, and the second class comprised captives taken within the island who belonged to their own primary clan for marriage purposes but to the sub-clan of their captor in respect of land rights. In the New Georgia group today, large numbers of descendants of Isabel captives can be found.

Isabel and Choiseul populations were most noticeably affected by head-hunting towards the end of the nineteenth century following an intensification of raids carried out by Roviana chiefs to the Manning Strait region. Historian, McKinnon (1975), attributed the rise in large-scale raids observed at this time to a cyclical increase in trade between Europeans and local communities and the pursuit of prestige by chiefs. Tortoiseshell, or specifically the shell of the Hawksbill Turtle, was one of the most sought-after trade items by Europeans in the Pacific from the 1840s (Bennett 1987: 29), and by the 1850s chiefs from Roviana Lagoon had mastered this trade (Sheppard 2019b). As turtle populations diminished within coastal regions of the New Georgia group, Roviana parties travelled more frequently to the Arnavon Islands and coastal areas of northwest Isabel and southeast Choiseul to hunt turtles and collect heads.

In essence, most large-scale raids in the latter half of the nineteenth century were economic as well as spiritually and socio-politically driven ventures. McKinnon succinctly summarised that "just as trader and big man were linked in a type of symbiotic relationship, so it appears that indigenous trading and largescale raiding were mutually dependant" (1975: 300). Head-hunting raids ceased by the beginning of the twentieth century, with one of the last recorded raids taking place in Bughotu in 1898 (Allan 1988: 11). Zelenietz (1979: 104) attributed its cessation to a combination of both indigenous and external processes which he summarised into three factors: 1) the adverse economic effects raids were having on copra production which locals traded with Europeans; 2) justification for its cessation was provided by the presence of British administrators and police trying to suppress head-hunting; and 3) decisions made by chiefs to end raids were reinforced shortly thereafter by the introduction of a new moral system taught by Christian missionaries.

Settlement distribution and the mobility of communities in Isabel and Choiseul were greatly impacted by the intensification of head-hunting in the late nineteenth century. In Isabel, early missionaries (Welchman n.d.) and contemporary anthropological researchers (Allan 1988; White 1991) have documented largescale coastal to inland migrations and a generally eastward migratory pattern of Zabana speakers to the southern half of Isabel. In southeast Choiseul, there is a similar pattern made evident by the abandonment of Wagina recorded in local oral histories. During a survey of southeast Choiseul, Miller (1979: 61) recorded that "early inhabitants [on Wagina] were exterminated or driven away by Roviana head-hunters", and that the island "then became known as an area for burials and sacred shrines and as a battle ground". For all coastal communities in the Western Solomons, the pressure and fear of head-hunting raiding parties inspired security and defence to be key criteria in selecting a site for settlement. Secluded hillforts (called *toa* in Zabana) and fortified village complexes, a prominent example being Nusa Roviana (Walter and Sheppard 2017: Fig 7.22), were important places of refuge from head-hunters and during times of warfare between clans. In the Bughotu region, treehouses were built, "some 150 feet high" (Penny 1887: 47), to serve as protection.

Population numbers also suffered as a result of head-hunting raids. Missionary Brown noted that "owing to the raids of the Roviana head-hunters, there were at the time of our visit [to Isabel in 1879] only a few villages left, except at the east and west ends of the island; and the same affects were noticed on Choiseul" (Brown 1908: 517). Another important impact of the increase in head-hunting expeditions and, particularly following the integration of iron and other European wealth in regional trading circles, was the ascension of very powerful chiefs. Notable examples include Bera of southern Isabel, Ingava of Roviana and Gau of Vella Lavella, all of whom amassed considerable power through conducting successful head-hunting raids and by forming alliances using gift exchange and favours (Jackson 1975: 67). Towards the end of the twentieth century, some prominent chiefs who had earned reputations as great warriors also played important roles in the integration of Christian teaching into traditional societies.

4.2.3 Christianisation and Pacification

Anglicans serving under the Melanesian Mission, Methodists and Catholics were the earliest Christian missionary parties to become established in the Western Solomons. On Isabel, White (1991: 93) documented that the first attempt at missionisation resulted in failure as Marist Catholic Bishop Epale was killed when he set foot in Bughotu in 1845. Catholics did not return to the island following this, and the next attempt, which proved to be successful, was made by Bishop Patteson of the Melanesian

Mission who visited Bughotu in 1861. The mission vessel, *Southern Cross*, visited Bughotu several times thereafter and took young men for education in New Zealand and Norfolk Island (Jackson 1975: 69).

It was not until after 1886 with the support of a powerful Bughotu chief from Sepi Village, named Soga, however, did the Melanesian Mission's position and influence in Isabel began to properly strengthen. Jackson (1975: 72) wrote that during that year, "an influenza epidemic swept through southern Isabel, and Bishop Selwyn treated Soga and the whole of the Christian congregation. Soga recovered and in gratitude for his restored health allowed a school to be established at Sepi". From then on until his death in 1898, Soga was an instrumental figure for the mission as his authority enabled some of the first laws and reforms to be enforced. Following his conversion in 1889, Soga made armed expeditions to various parts of Isabel and to Ngella and Savo to urge an end to head-hunting and the acceptance of Christian teaching. One of the most remarkable accomplishments Soga made as a peacemaker, White (1991: 99) described, was his alliance with the Kia leader, Rona. The first European missionary to reside permanently on Isabel was Henry Welchman in 1890 (Figure 4.). Penny had lived there for several years in the early 1880s, and another missionary, Turnbull, for four months in 1888. But Welchman's residence lasted, on and off, for 18 years. From the 1900s, the Melanesian Mission experienced considerable success on Isabel and today almost the entire population of the province is Anglican.

Figure 4.8 Henry Welchman's residence at Maranatabu, Isabel. (Source: www.solomonencyclopaedia.net)

The arrival of missionaries to Isabel and Choiseul and the integration of Western and Christian values and beliefs into traditional societies impacted considerably upon local settlement patterns and exchange practices. From the inception of missionary activity in the Western Solomons in the mid-1800s, Christianity was most likely associated in indigenous peoples' minds with material advantage and interpreted as an additional source of obtaining European goods (Hilliard 1966: 468). Local residence of a missionary, where they were welcomed, provided convenient access to European-type wealth which previously could only be sought from resident traders or visiting ships. In his doctoral study of the development of Protestant missions in Solomon Islands, Hilliard (1966: 469) described that missionaries sometimes offered prizes of beads and fish-hooks for regular attenders at school, as well as presents to the whole village in return for special assistance such as the erection of a schoolhouse. Local perceptions of *waet man* ("white man") and Christianity began changing as church groups, in parallel with colonial administration, encouraged pacification and an end to warfare. This renewed value of maintaining peace between brother and sister communities was one of the most transformational impacts of Christianisation movements.

Following the termination of head-hunting raids, communities began feeling safer and were encouraged by Church groups and colonial administrators to resettle the seaside. Converted communities and chiefs, such as Soga in Bughotu, were also instrumental actors in this trend in settlement. Diseases introduced by resident missionaries and catechists trained overseas, which became more easily spread in households clustered around schools and churches in coastal villages, also affected populations in Isabel and Choiseul. Although biased by his competitive and averse attitude towards the Melanesian Mission, Methodist missionary Brown argued that Anglican missionaries were neglecting the local populace in Bughotu. He commented that the population seemed to have declined during the 20-year gap between his visits, suggesting that this was because of the continuation of head-hunting and the spread of introduced disease (Brown 1908). In his journal notes, Welchman described advising people moving in the Bughotu region to remain in the hills for health reasons (Welchman n.d.). Ultimately, the gradual shift in population distribution from enclosed inland to open coastal settlement consequently moulded much of the population distribution visible today.

4.2.4 Discussion

Three points of discussion can be raised from the review of the historical literature. The first is centred upon the nature and extent of settlement that is described in European accounts from 1568 to the late-1700s. The second point builds upon this and is a deliberation of the impacts made to settlement patterns and trade and exchange systems in the mid to late-1800s that were brought about by the intensification of head-hunting, greater integration of European commerce and goods, and the growing influence of missionary groups. The third point deliberates the portrayal in historical accounts of Manning Strait as a contested seascape. This final point is expanded upon and compared against existing and new archaeological findings in Chapter 10.

From examining translated notes from Mendana's first voyage to Solomon Islands (Amherst and Thomson 1901) and Surville's anchorage in Port Praslin (Fleurieu 1791), populations in Isabel appear to have predominantly dwelled inland with minor evidence for heavily populated coastal settlement prior to the nineteenth century. The largest populations are described to have resided inland on Barora Faa and nearby islands located off the northwest mainland. In the southern half of the province in the sixteenth century, sizeable populations are described to have inhabited inland regions from Maringe to Bughotu and on San Jorge Island. Today, San Jorge Island is virtually uninhabited, and it appears that at some point from Mendana's first visit to Isabel, the sizeable populations described by the crew declined considerably. Allan (1988: 10) documented in Kia "that depredation by New Georgia head-hunters began in the western areas about seven generations ago, or towards the end of the eighteenth century". If this is the earliest period from which head-hunters from the New Georgia group began carrying out raids on Isabel populations, it is very likely that the wiping out and displacement of coastal communities that occurred, and intensified, over the next century considerably impacted upon population numbers. Communicable diseases that spread from early European explorers and traders prior to the mid-1800s, and that would have become more widespread following the arrival of missionaries and overseas-trained catechists, are also likely to have contributed to this reduction in population.

In northwest Choiseul, Choiseul Bay is portrayed in Bougainville's late-eighteenth century account to be quite densely inhabited and parts of the coast are described as exploited as coconut groves (Fleurieu 1791). Surville's crew witnessed similar groves of planted fruit and nut trees in northwest Isabel. Displacement, migrations and a decline in populations caused by head-hunting are less well-documented for Choiseul populations. However, in similar fashion to the modern population distribution of Isabel, a greater concentration of people found today in the northwest end of Choiseul compared to the southeast end, excluding Wagina' Gilbertese population, is very likely to be evidence for head-hunting raids triggering gradual migratory movements northwards from southeast Choiseul. Only until the cessation of head-hunting at the end of the nineteenth century, which was influenced considerably by the strengthening presence of missionaries and gradual adoption of Christian values, were communities in Isabel and Choiseul able to comfortably resettle the coast.

The permanent settlement of traders in the Western Solomons from the 1840s and the subsequent arrival of missionaries gave local communities and chiefs unprecedented access to iron goods such as tomahawks. Existing trade networks were impacted by this increased access to, and more widespread distribution of, European products and this appeared to be primarily for the betterment of Roviana chiefs. There are likely also to have been detrimental impacts made upon trade networks although they are not as well depicted in the historical literature. For example, the rise in raids reaching coastal villages and widespread displacement of communities in Isabel and Choiseul are likely to have disrupted local trade and exchange networks. Archaeologist, Reeve (1989: 63) conjectured that head-hunting attacks may have disrupted the trade of pottery out of Choiseul and contributed towards the gradual abandonment of the use of pots within the New Georgia group. The same affect is also likely to have occurred in southeast Choiseul where pottery is evident in the archaeological record but is mostly unknown to villagers today as well as in the 1970s (Miller 1979).

Competition for prestige and trade resources between chiefs and head-hunting communities in the Western Solomons portray Manning Strait as a highly contested seascape. Hints to this perception are given in some of the earliest European accounts of encounters with local inhabitants who are depicted as warlike and in constant flux of war. Surville's crew, for example, were convinced from their own experience of miscommunication and conflict with locals and after questioning a kidnapped Isabel villager that Port Praslin was a hostile environment. They wrote that "the inhabitants of the islands of Port Praslin, and the neighbouring lands, are in a continual state of war: the prisoners become the slaves of the victors" (Fleurieu 1791: 140). Similarly, Bougainville's confrontation in Choiseul Bay, during which he praised the strategic naval combat of the attacking parties, led him to assert that the local inhabitants were "almost always in a fate of war" (Fleurieu 1791: 95). Although created from a subjective viewpoint and customarily following brief encounters involving apprehension and misunderstanding experienced on both sides, these early historical accounts provide some insight into the development of heightened hostility and confrontation which characterised Manning Strait in the last few centuries. Today, a shadow of this highly contested past lives on, enduring in claims made by some Roviana, Isabel and Choiseul communities over the traditional and ancestral ownership of the Arnavon Islands.

4.3 Conclusion

The comprehensive review of ethnographic and historical literature given in this chapter has provided valuable insight into reconstructing patterns of historic migratory movements and settlement in Choiseul and Isabel. In addition, the review has shed further light on the development and extent of exchange networks and other forms of socio-economic and cultural interaction in the wider Western Solomons. Oral historical information about the origins of Isabel inhabitants demonstrated a relatively uniform sequence and direction of human settlement. Its earliest inhabitants, described by Bogesi (1948), came 'from the west' and settled Barora Faa and Barora Ite Islands before entering and dispersing throughout the mainland. Significantly, archaeological findings from this study and other studies carried out in northwest Isabel (Carter *et al.* 2012) demonstrate a similar sequence of settlement (discussed in Chapter 5). On Choiseul, accounts of origin stories also portray people arriving 'from the west' and depict ancestral and spiritual ties with Bougainville. Specifically, Bougainville is described as a 'returning point' for spirits and souls.

The review of ethnographic and historical documentation of trade networks, head-hunting, shrines and burial practices in the Western Solomons provide evidence of Choiseul and Isabel engaged in three separate networks or spheres of interaction by at least as early as the late eighteenth century. Illustrated in Figure 4.5, these spheres included a northwest Choiseul-Shortland Islands-southern Bougainville sphere, a southeast Choiseul-New Georgia group-northwest Isabel sphere and a southern Isabel-Ngella-north Malaita-east Guadalcanal-Makira sphere. Underlying these spheres were cultural and linguistic commonalities (e.g. see Walter and Sheppard 2017: Chp. 2), but they also reflected important biogeographic factors. Specifically, the naturally linear formation of the Solomons archipelago and the proximity between populations in these spheres appeared to have played an integral role in influencing the degree of interaction between island communities in the last millennium. The formation of these networks of interaction is discussed in more detail in Chapter 10. In the next chapter, archaeological findings from field research conducted as part of this study are presented to provide further insight into earlier prehistoric patterns of settlement and interaction in the Western Solomons.

Chapter 5 Archaeological Sites and Fieldwork

This chapter outlines the site survey and excavation strategies utilised in this study and presents results of the field research undertaken in Isabel, Arnavon Islands and Choiseul. It is divided into five sections. The first lays out the approach taken to the surveying and excavation of sites in the Manning Strait region to address the research aims and objectives stated in Chapter 1. The second, third and fourth sections present results of fieldwork carried out at sites on Isabel, Arnavon Islands and Choiseul, respectively. Each section begins with a review of archaeological field research that has previously been undertaken in that region, followed by detailed descriptions of key sites that were investigated. The chapter is concluded with a summative discussion about how the new findings have expanded upon previous field research and contributed to refining archaeological sequences of the prehistoric settlement of the Western Solomons.

5.1 Site Survey and Excavation Strategies

Fieldwork was carried out on Isabel, Arnavon Islands and Choiseul over five expeditions carried out between July 2016 to January 2019. Totalling approximately four months, the fieldwork involved surveying and the recording of new sites, excavating, and meeting and speaking with community members and landowners to record oral historical information about the archaeological landscapes. As was stated in Chapter 1, the field research was guided by three objectives:

1) To survey the region and improve upon the recorded distribution of archaeological sites in and around Manning Strait using a geomorphologically informed approach.
2) To build upon a temporal framework of the prehistoric occupation of the region using excavation and radiocarbon dating.
3) To analyse material culture, namely pottery, lithics and worked shell artefacts, as proxies for broader social movements in prehistory such as colonisation, migration, exchange and innovation.

The first field trip, which was to the Arnavon Islands in 2016, was integral to gaining permissions and setting in motion the site survey and excavation programme. It was part of a joint research and conservation project between The Nature Conservancy (TNC) and Professor Walter (Walter & Brooks 2014). Fieldwork was carried out with the assistance of rangers employed by TNC who were stationed on the Arnavon Islands. The rangers resided from Kia in northwest Isabel, Kukutin located on Wagina and Ruruvai and other villages in southeast Choiseul. As the rangers began to recognise the artefacts and sites we were searching for and became more knowledgeable of our research methods, interest arose among some of the rangers for their home villages to be surveyed. Following this, my network of local contacts for further field research in Manning Strait began to take shape and areas of interest to return to and survey were mapped out.

5.1.1 Survey Strategy

To fulfil the field objectives, the site survey was focused on geographic zones that had been demonstrated in previous research in Solomon Islands and wider Island Melanesia to be geomorphologically suitable locations of settlement during the Pleistocene and mid to late-Holocene (e.g. Wickler 1993; Roe 1993; Felgate 2003; Shaw 2014). These included rockshelters situated typically in limestone coral formations near the coast or inland as well as intertidal reef flats located on small, offshore islands. Site visibility for both these environments was influenced by rainfall and vegetation, especially dense coastal mangrove or lowland forest growth. Periodic tidal activity and swell in addition to long-term sea level rise also impacted upon my ability to identify intertidal sites (see Felgate 2003: 159-161, 270-272 for more comprehensive discussion on intertidal site visibility in the Western Solomons).

For the identification of late prehistoric and historic sites, the most commonly targeted geographic zones were hilltops, ridgelines and raised terraces located near the coast (e.g. Roe 1993; Miller 1979). In southeast Choiseul, specifically on Wagina, Laena Island and near Rokoso Village, these zones typically contained historic village sites which were described to me to by locals and artefact scatters containing plain, incised and impressed ceramics and flaked chert artefacts. Today, ridgelines and raised terraces located near modern villages in southeast Choiseul are popular gardening zones which was advantageous for site surveying as the cleared vegetation improved ground visibility.

Sites were accessed using outboard motor, canoe or on foot. The method employed in site recording involved describing for each site the location and environment, the nature and extent of archaeological evidence, important features and stratigraphy if excavated, and the range of artefacts identified. Sites were also sketched, photographed and plotted using a handheld Garmin Outdoor GPS. These details were documented on a standardised site record form template originally created by Dr Timothy Thomas at the University of Otago, and were copied for SINM's records. Sites were assigned a three-letter site code which was recorded using the first three letters of the place name and a number from a sequential series beginning with one (e.g. "WAG-1" = first site on Wagina). Local and English names for each site or the general area where the site was located were used. If none existed, a descriptive name was given.

5.1.2 Fieldwork in Practice

Gaining permission and establishing a rapport with local landowners as well as provincial government authorities was initiated prior to and during the first field trip. It was a vital first step and is emphasised as being an ongoing process in initiating fieldwork in Solomon Islands where most of the land is owned and traditionally managed by provincial councils, clans or villages and family units. As a citizen of Solomon Islands, I was not legally required to possess a research permit to undertake the fieldwork. Nevertheless, the project was designed and the fieldwork was carried out in collaboration with Solomon Islands National Museum (SINM), the Isabel Provincial Office in Buala and with Choiseul community leader representatives and tribal chiefs from Rokoso, Nuatambu and Kukutin.

Upon visiting a village, meetings were held with the community, usually with chiefs and elders, and these were vital to communicating the intentions and process of the fieldwork as well as to reaching an agreement concerning a desired outcome for the village. This was always a summary research report and it was imperative for me to make clear that the research was not intended to develop prospects of financial compensation or profit. Having grown up in Solomon Islands and being fluent in Solomon Islands *Pijin*, I was already experienced and familiar with social etiquette involved in meeting a new community and being a respectful guest in their village. However, given how diverse the country is, both linguistically and culturally, familiarity can only take you so far.

It was common for my research team, after community talks had been given, to continue to encounter and take measures to manage uncertainty of a foreign group entering a village, distrust in visiting and 'digging' up ancestral ('*tambu*') sites and politics of land access. Other challenges we faced included the research project being viewed by some locals upon first glance as commercially driven (e.g. 'digging gold' or selling precious stones). Speaking to those doubtful community members and showing them artefacts recovered from the excavations usually resolved this. However, sometimes obstacles to the fieldwork, typically internal land disputes between chiefs or rival families, were not in our control and the excavations or surveying would have to be ceased. Unfortunately, this arose at two of the sites, Nuatambu and Mendana Bay. Although results from the fieldwork that was able to be carried out before the fieldwork ended at the sites is still included in this chapter.

During fieldwork, it was customary to have at least one representative from SINM as part of the field research team and to hire research assistants from the village where we were being accommodated. No formal interviews were carried out as part of this study although any opportunities that arose to discuss oral histories with local landowners and community members was actively taken. Many of these discussions or 'story-telling' occurred on-site with field assistants and at the village accommodation, usually with males who were more comfortable in visiting my living space. Openness with sharing stories and food was vital for establishing rapport with village communities in the field.

5.1.3 Excavation Strategy

In order to maximise the number of sites investigated during field research and to sample all potential phases of prehistoric occupation, vertical testing was prioritised as opposed to extensive areal excavation. Excavations were, in most instances, limited in their areal extent to 1 to 2 m^2 to provide sufficient time for artefact processing. Although this was also influenced by the results of initial test-pitting regarding the horizontal and vertical extent of the site, as well as by the size of my excavation team and fieldwork timeframes.

Excavation was carried out following the natural stratigraphy and using 10 or 20 cm arbitrary spits. Three-dimensional recording and photographing of important *in situ* artefacts was practised. Sieving was carried out using 6.4 mm and 3.2 mm sieves, and at all the excavated sites except for Laena Island as they were unavailable. All excavated cultural material was bagged, provenanced by site, spit, layer and excavation unit and transported to the Otago Archaeological Laboratories (OAL) to be analysed. The only exception to this was large quantities of Trochus and Tridacna shell excavated in the Arnavon Islands which were measured and left on site due to transportation difficulties.

5.1.4 Overview of Survey Results

A total of 37 new sites were recorded (Table 5.1). The majority of these were identified on Wagina and Laena Island in southeast Choiseul, and included surface scatters of pottery, chert, human burials, overhanging rockshelters, caves, hillforts, ridgetop sites, and shell caches constructed from flat coral slabs or cobbles (Figure 5.1).

Table 5.1 Sites recorded in Manning Strait region by geographic zone.

Site Type	**Geographic Zone**			**Count**
	Coastal	*Coastal Hills/Ridges/Terraces*	*Inland*	
Historic village	-	1	-	1
Surface/sub-surf. pottery	2	4	2	8
Surface chert scatter	2	-	1	3
Shrine/shrine complex	5	1	1	7
Burial	4	1	-	5
Rockshelter/cave	3	3	4	10
Hillfort/hilltop	-	2	-	2
Shell-grinding station	1	-	-	1
Total	17	12	8	37

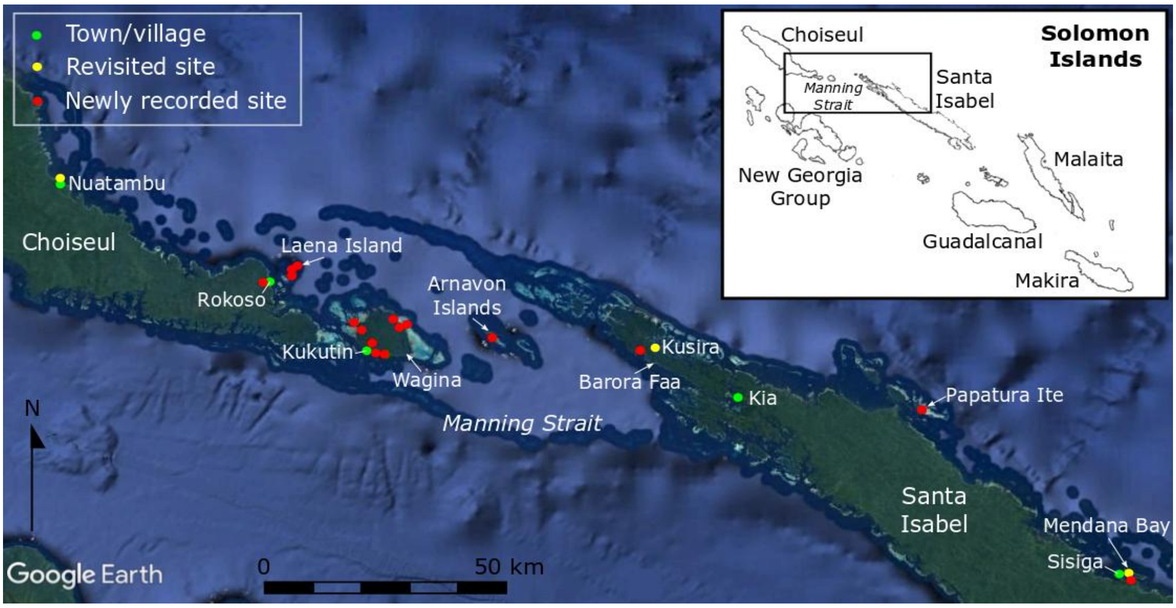


Figure 5.1 Map of Manning Strait showing location of newly recorded sites, revisited sites and key towns/villages.

Three sites were also revisited. These were the intertidal ceramic sites, Nuatambu (Miller 1979) located in Choiseul and Kusira situated in northwest Isabel (Carter *et al*. 2012), and a chert quarry site in Estrella Bay, known locally as Mendana Bay, which is located in central Isabel (Roe *et al*. 2007). The process and intentions behind revisiting these sites are given later in the chapter in the independent descriptions of the sites.

More detailed summaries of the results of the surveys and excavations carried out on Isabel, Arnavon Islands and Choiseul are described in the remainder of this chapter. Emphasis is placed on describing the most informative sites for each of the main regions surveyed. A catalogue of all the newly recorded sites is given in Appendix A.

5.2 Santa Isabel Sites

Three reconnaissance surveys were carried out on Isabel and were concentrated on three parts of the province. These included the islands of Papatura Ite and Barora Faa located in the northwest end of the province, and Mendana Bay, located near the centre of the province (Figure 5.2). Surveying on Papatura Ite was carried out over three days in late January 2017 and for two days between the 2017/2018 New Year. Surveying of Barora Faa was limited to coastal surveying by outboard motor that took place during return journeys between Kia and the Arnavon Islands in late July 2016 and late January 2017. The survey of Mendana Bay was carried out over two days in late January 2017, and intentions to excavate the site were unfortunately disrupted due to disagreements between local chiefs. Before the results of these brief surveys are described, it is important to first review previous archaeological field research carried out on Isabel and provide further context to the reasoning behind the selection of sites that were investigated in this study.

5.2.1 Review of Previous Field Research

Archaeological fieldwork was first undertaken on Isabel in 1978 by Daniel Miller as part of the National Sites Survey (NSS) programme (Miller 1979), and preliminary field investigations of this nature were continued in the 1990s by SINM (Keopo 1994, 1995; Keopo & Kiko 1994; Mukaida 1991). These projects, which were concentrated in Bughotu and the Kia District, resulted in the recording mainly of historic village, defensive and sacrificial sites associated with head-hunting. Overall, surveying carried out in the 1970s and '90s was limited to a small number of regions and focused on sites known to local communities. Moreover, no excavations or radiocarbon dating were carried out.

More comprehensive field research was undertaken between 2006 to 2007 by David Roe, Martin Gibbs and Melissa Carter as part of their project entitled the 'Archaeological and Historic Site Study of Santa Isabel' (Roe *et al*. 2007). In the first season, two months of fieldwork were carried out in Kia and Bughotu and resulted significantly in the first excavations on Isabel. These were concentrated on hillfort sites near Kia, known as *toa* in Zabana, which mainly uncovered shell midden deposits (Figure 5.2). In the Bughotu region, their survey of a coconut plantation on Vitora Island resulted in the first ever recorded pottery sherds on Isabel. These comprised a total of 32 plain sherds all collected from the surface (exhibited in Carter *et al*. 2012: Fig. 3).

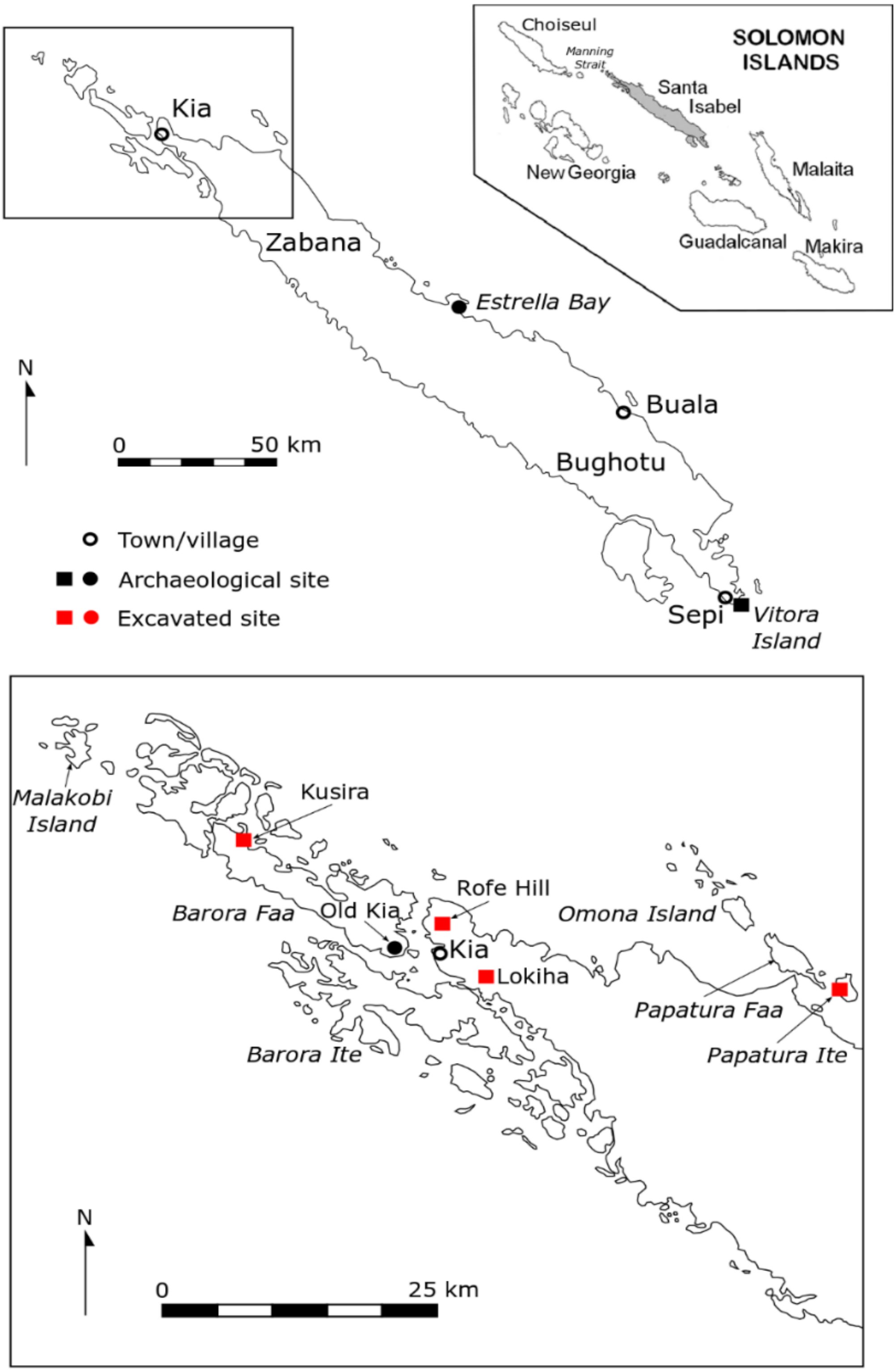


Figure 5.2 Maps of Isabel and Kia District showing key islands and archaeological sites. Square symbol indicates ceramic deposit.

In the second field season, Gibbs and Lawrence Kiko visited Mendana Bay to assess evidence of Spanish explorer Mendana's landing. Their survey resulted in no evidence of Spanish occupation, although they recorded scatters of flakes fringing the beach with links to a chert quarrying site located at a hillslope near the bay (Roe *et al*. 2007: 7). This was significant as no such site has been documented in the Western Solomons. Typically, chert quarries are associated with chert adze-manufacturing practices in Makira, Ulawa and Malaita located in the Central Solomons (Ward 1976; Ward & Smith 1974). From the discovery, Gibbs argued that the site "provides evidence of significant production of chert flakes, at a scale which would suggest the possibility of trade both within the region and beyond" (Roe *et al*. 2007: 9). Although located outside of Manning Strait, the intention of revisiting the site as part of this study was to expand upon Gibbs' interpretation by establishing a temporal framework of the occupation of the site through excavation and dating. In addition, flaked chert artefacts were planned to be collected from the site to assess the variation in technological and visual properties of the chert tools compared to other artefacts found in the Manning Strait region (examined in Chapter 8).

Between 2007-2011, Carter and John Keopo carried out further fieldwork in the northwest of Isabel as part of Carter's postdoctoral research with the University of Sydney. Her research, entitled the 'Zabana Archaeological Research Project (ZARP)', was centred upon the timing and nature of early human settlement in Isabel and the development of marine subsistence patterns during the late Holocene to early historic period. She expanded upon the 2006 investigations of hillfort sites in near Kia, and at Rofe Hill, recovered six plain pot sherds from a 1 x 0.5 m excavation of a stratified midden deposit. The ceramics were found in all three stratigraphic units of the test pit and she argued that their deposition ranged from "initial occupation dated at 1880–1610 calBP (WK24901) to the recent historic past (106 calBP, Wk24898) when the site was abandoned" (Carter *et al.* 2012: 64). Her most substantial pottery assemblage of 205 sherds was recovered from multiple excavations at Lokiha. The site was not dated, however the identification of an incurving vessel form resembling cooking pots made in northwest Choiseul in the mid-twentieth century AD suggested historic occupation.

Carter's discovery of pottery at Kusira was significant as it is one of only two assemblages that have been found on Isabel which exhibit stylistic affinities with late Lapita styles documented in the New Georgia group. The other is the assemblage reported in this study from Papatura Ite. Carter's small sample of pottery collected from

Kusira contained a single rim sherd decorated with a row of punctate beneath the lip which closely resembled Kopo-style sherds from Roviana Lagoon (Figure 5.3). Radiocarbon dating of the site, which is in preparation to be published (Radclyffe and Carter in prep.), to approximately 2100 calBP supports the likelihood of Kusira being a late Lapita intertidal settlement. In addition, findings from petrographic analysis carried out on pottery from Rofe Hill, Lokiha, Kusira and Vitora Island by William Dickinson, which will be included in the article in preparation, has demonstrated the most likely origin of these ceramics to be Choiseul. Therefore, Carter and Dickinson's findings indicate that inter-island interaction occurred across Manning Strait from the earliest recorded phase of occupation of Isabel and likely continued over much of the last two millennium.

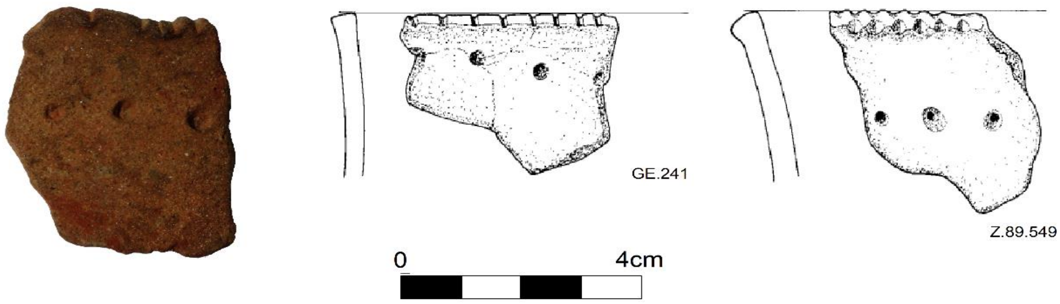


Figure 5.3 Decorated rim sherd from Kusira (coloured image) and Kopo-style rim sherds found in Roviana (drawings). (Adapted from Carter et al. 2012: Fig. 7 and Felgate 2003: Fig. 19).

Overall, research carried out by Carter and her colleagues has provided important insight into the prehistoric settlement of Isabel. Investigations of hillfort sites in northwest Isabel have indicated a pattern of intermittent inland hilltop occupation in the region during the last two millennia. Prior to this, there is evidence of an earlier tradition of coastal stilt-village settlement as has been found in Roviana and other parts of the New Georgia group (Felgate 2003; Walter and Sheppard 2017: Chp. 5). Additionally, petrographic analysis carried out by William Dickinson on pottery found on Isabel suggests pottery exchange was practised between Choiseul and Isabel from as early as about 2100 calBP and lasted well into the historic period. An important aim of the field research carried out in northwest Isabel as part of this study was to build upon this sequence of prehistoric settlement. Some success was made in reaching this aim, demonstrated by the discovery of a late Lapita intertidal ceramic site on Papatura Ite. Although unfortunately no stratified deposits were identified which were suitable to be dated. A summary of the results of the field research carried out on Papatura Ite, Barora Faa and Mendana Bay is given below.

5.2.2 Papatura Ite Island

Reconnaissance surveys of Papatura Ite Island, which will hereby be referred to as Papatura, revealed a wide surface distribution of chert artefacts across much of the island's interior as well as a single intertidal scatter of pottery and chert on its western coast (Figure 5.4). The island measures approximately 2.8 sq. km in size and forms part of an extensive reef and islet chain that fringes the northwest coast of Isabel.

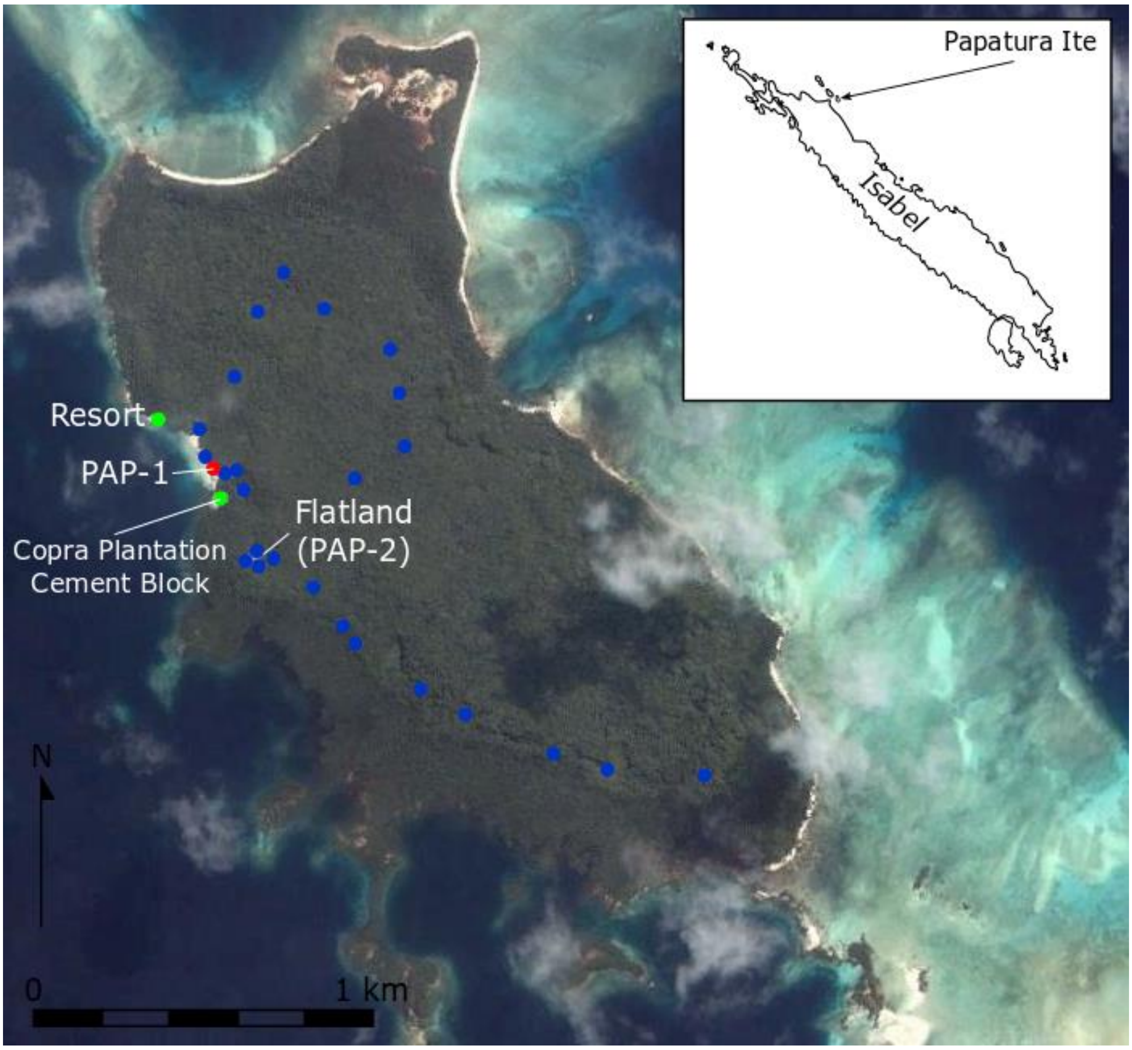


Figure 5.4 Map of Papatura Ite Island showing locations of two sites. Red circles = pottery; blue = chert spot finds; green = modern structures.

On the island, ground visibility was generally poor except on the coast and traversing inland was made difficult due to thick lowland forest vegetation. Most of the chert spot finds were made while walking along tracks which had been created for tourists by staff of a small family-owned resort located on the island. Chert flakes were found sporadically near the centre and southern end of the island, sometimes clustered in streams or dried stream beds. The highest densities of artefacts were found at two sites, PAP-1 and PAP-2, and these are described below.

PAP-1 Intertidal scatter

The site was identified at the mouth of a stream located about 150 m south of the lodges (Figure 5.5). The stream, which measured about 2 m wide and 1.5 m deep, was one of two streams located south of the lodges which are fed by rainfall and underground springs located inland. No pottery and only two chert flakes were found at the other stream. A total of 432 sherds exhibiting affinities with late Lapita ceramics recorded in Roviana (Felgate 2003), 19 chert flakes and a few other artefacts including a Tridacna shell chisel, turtle bone, fish vertebra and sea urchin fragments were collected from the surface of the site.

Figure 5.5 Photograph of PAP-1. Facing north with part of Papatura Resort in top left of image.

Pottery was found sporadically along 70 m of the sand beach coastline near the stream and as far as approximately 90 m up the stream – a dispersed distribution most likely created artificially from tidal fluctuations, wave exposure and the stream flooding. The pottery was most highly concentrated within a 1200 m^2 zone that encompassed the mouth of the stream and the intertidal sandflat directly outside it and this was interpreted as a more accurate extent of the original stilt-village deposit. This was comparable in size to a pottery concentration recorded at another late Lapita intertidal stilt village site, Zangana, located in Roviana Lagoon (Felgate 2003: Fig. 118). The chert artefacts shared a similar distribution to the pottery, appearing on the surface at the mouth of the stream and as far upstream as the pottery.

Within a randomly selected 3 x 3 m plot placed at the edge of the stream about 20 m upstream, 13 pot sherds were recorded. This density of surface pottery was comparable to Kusira where Carter counted 12 sherds in a randomly placed 3 x 3 m^2 plot (Carter *et al*. 2012: 65). Near the mouth of the stream, a few sherds were found within the roots of a fallen coconut tree suggesting buried ceramic deposits. A spade pit was dug on a sand bank located a few metres south of the stream at the high tide mark which appeared to be protected from flooding of the stream and tidal action. The stratigraphy consisted of an upper silty, sandy topsoil layer containing roots (0-7 cm), and a lower layer of wet, white fine sand intermixed with coral and shell (7-90 cm). Deeper excavation was inhibited due to large root growth and no buried artefacts were recovered. The spade pit did indicate, however, that the sand bank was most likely created in the recent past through wave and tidal-induced displacement of the beach sediment. Coastal progradation of the western coast of Papatura Ite since the inhabitation of PAP-1 is considered unlikely as recent studies of the impacts of sea-level rise and coastal erosion on reef islands in northwest Isabel have demonstrated evidence of severe shore recession since 1950 (Albert *et al.* 2016). Therefore, it is likely the stilt village originally extended further out over the water and buried deposits have been destroyed over time. Although further test pitting, which is recommended to be placed further inland from the high tide mark, may prove otherwise.

PAP-2 Flatland

On a flatland located 200 m southeast of PAP-1, a shell adze bevel fragment was found amongst a scatter of chert flakes and fragments of Tridacna and other large marine shell species (Figure 5.4). This area, which is one of the largest expanses of flatland on the island, had a generally high level of ground visibility due to sparse tree growth and young shrub and flower vegetation. It was likely to have been exploited as a coconut grove by a copra plantation that operated on the island in the 1940s. A large rectangular cement foundation remains near the coast located south of PAP-1 which was used as a storehouse for the copra.

Two spade pits were dug within the area and their stratigraphic profiles were uniform, containing an upper layer of dark brown topsoil (0-15 cm), a middle layer of lighter coloured brownish grey sand (15-25 cm), and a lower layer of greyish white sand (>25 cm deep). The last layer was dug to a depth of 118 cm in one of the test pits at which point the water table was reached. The only finds were shellfish which exhibited no obvious working or evidence of burning. Comparing the stratigraphy of this site to the incomplete spade pit dug at PAP-1, it was considered unlikely this area formed part of an earlier coastline which stretched towards PAP-1. The shell adze fragment and chert flakes were more likely to have been discarded by inhabitants of the stilt-village at PAP-1 gardening or venturing inland.

5.2.3 Barora Faa Island

Surveying of Barora Faa, which is much larger than Papatura and measures approximately 75 sq. km in size, was targeted at the identification of intertidal ceramic and chert-bearing sites. Apart from a brief visit to Kusira where four pot sherds and six chert artefacts were collected, the only site identified was a small surface scatter of flaked chert located by the mouth of a stream at the northwest end of the island in an area known locally as Poaraghi (Figure 5.6). A few larger river mouths located several kilometres south of Poaraghi were approached by canoe, although, they were not visited on foot due to rough seas preventing docking.

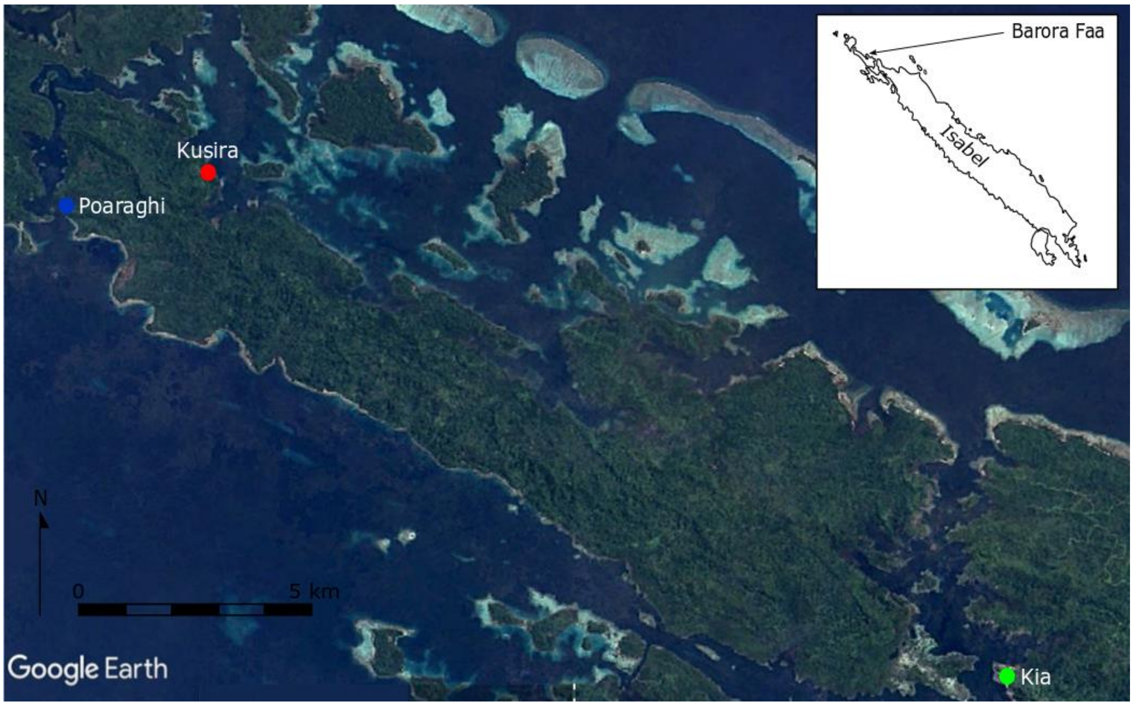


Figure 5.6 Map of Barora Faa showing location of Poaraghi. Red circle = pottery; blue = chert spot finds; green = modern village.

POA-1 Poaraghi

Poaraghi is uninhabited although a lagoon adjacent to the stream is frequented by Kia villagers who fish there. Two water-rolled flakes and a core were collected from the white sand beach surrounding the mouth of the stream. No pottery was identified upstream or on the beach, although our survey was made brief due to increasing winds and the onset of heavy rain. No chert cobbles were identified within the stream at Poaraghi, and as no source of chert has yet been recorded on Barora Faa it is likely that chert artefacts found at Poaraghi and Kusira were procured from the mainland. Following the brief survey of Barora Faa, it was demonstrated that intertidal mudflats such as Kusira and freshwater streams located in protected inlets such as Poaraghi were the most promising environments to find intertidal ceramic sites.

5.2.3 Mendana Bay

The reconnaissance survey of Mendana Bay located on the northern coast of central Isabel was targeted at relocating and excavating the chert quarry and flaking site recorded by Gibbs (Roe *et al*. 2007). Geologically, the headland forms part of the Bara Limestone Formation which "comprises a sequence of massive, porcellanous limestones with common chert" (Hawkins and Barron 1991: 33) (see brown shading of Isabel in Figure 3.7). Unfortunately, no excavations were able to be carried out due to disagreements between local chiefs. Two sites were able to be recorded during the one-day survey, MEN-1 and MEN-2 (Figure 5.7), and these are described below.

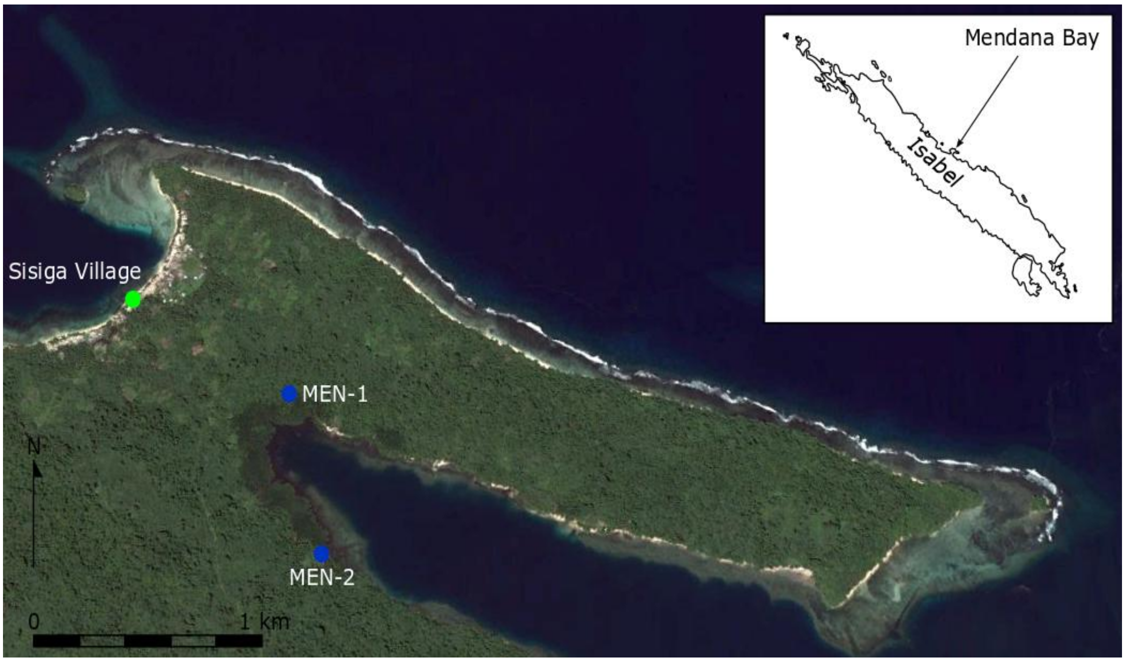


Figure 5.7 Map of Mendana Bay showing locations of Sisiga Village and archaeological sites. Blue circles = chert scatters; green = modern village.

MEN-1 Quarry and flaking floors

The highest concentration of flaked chert was found on a small flatland between two hillslopes and a mangrove located at the western end of Mendana Bay. A flaking floor was identified in the area measuring at least 800 m^2 in size and a total of 182 flakes and 12 cores were collected from its surface. Martin Gibbs had previously sketched the site and observed evidence of patterning in the spatial distribution of the chert artefacts (Figure 5.8).

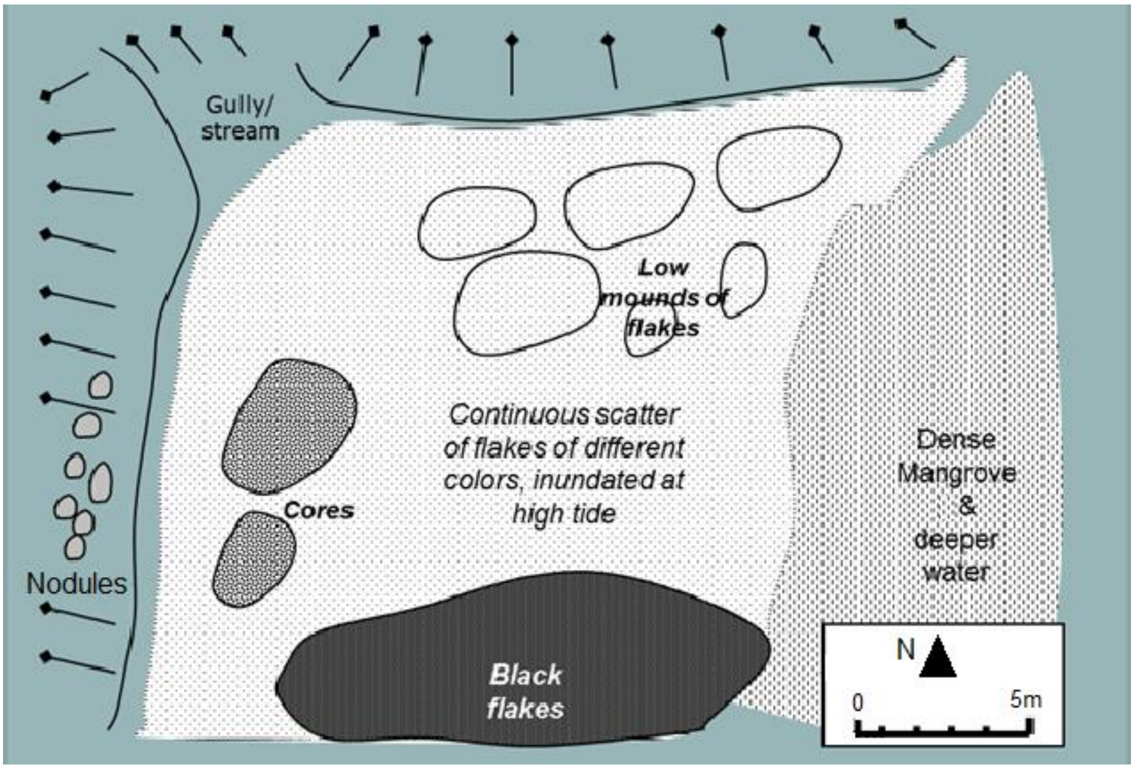


Figure 5.8 Sketch map of quarry and flaking site located at western end of Mendana Bay (from Roe et al. 2007).

He found that nodules of chert eroding from the hillslope had been quarried and prepared into cores that could be found nearby. My research team and I were not able to confidently identify a cluster of worked nodules or cores near the western hillslope, however, we did observe a few fragmented nodules around the flatland. Our inspection of the 'low mounds of flakes' suggested they were created naturally from mangrove tree and root growth, and proved to be richer in artefact density compared to the 'continuous scatter'. This difference in density was interpreted to have been caused by the tide dispersing the lower lying surface scatters of flakes. We identified a similar pattern of black flakes being concentrated near the southern end of the flatland, although the majority of flakes we collected during our surface collection were black.

Given the discolouration weathering can cause to chert, it was difficult to make our own interpretations about spatial patterning of the chert artefacts based on colour.

Overall, the survey of the site demonstrated that Mendana Bay was intensively exploited in the past as a reliable procurement zone of chert and as a site of core preparation and flake production. No other material culture was identified that could assist in estimating the age of the site. From the evidence, I argue, in agreement with Gibbs (Roe *et al.* 2007), that the significant production of chert flakes is a likely indication of trade both within Isabel and beyond.

MEN-2 Cliff-face chert deposit

The most siliceous and finest quality chert was found along a limestone cliff face located on the southern coastline of Mendana Bay (Figure 5.7). Large nodules, some baseball-sized or larger, were imbedded within a 3 m high exposed cliff face (Figure 5.9). At the base of the wall, the floor was covered in fragmented chert, some of which were clearly identified as worked flakes. The southern coastline was not surveyed further to determine the extent of this chert-bearing cliff face. Although, significantly, the identification of this exposure demonstrated that large, transportable chert nodules were easily accessible at Mendana Bay.

Figure 5.9 Limestone cliff face (MEN-2) imbedded with large chert nodules.

5.3 Arnavon Islands Sites

Two expeditions were made to the Arnavon Islands: a reconnaissance survey carried out from 18th to 21st July 2016 and an excavation carried out from January 28th to 8th February 2017. The fieldwork took place on a flatland located around two large upraised coral outcrops situated in the centre of Sikopo, which is the largest of the four atolls that make up the island group (Figure 5.10). This area was targeted as it had been demonstrated in previous surveying by Walter to possess coral mound shrines, a pottery scatter, and rockshelters (Walter & Brooks 2014).

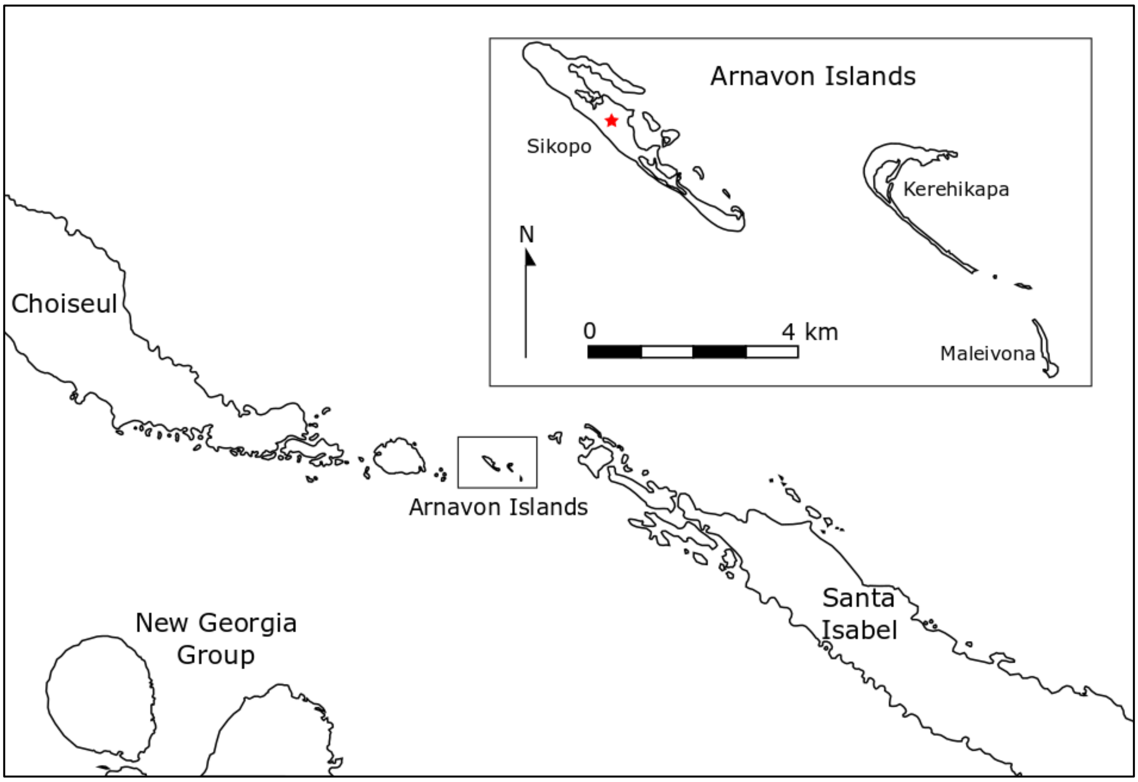


Figure 5.10 Map of Manning Strait showing location of Arnavon Islands. Red star marks location of archaeological sites.

The objectives of the 2016 reconnaissance survey were to map the distribution of surface pottery, identify and record the coral mound shrines using a GPS, and dig test pits to establish an understanding of the stratigraphic profile of the site complex. Three sites were recorded during the survey: a ceramic scatter (SIK-1), a large cave (SIK-2) and a complex of coral mound shrines (SIK-3). Test pits were dug at SIK-1 and revealed a near 1 m deep stratified cultural deposit which was systematically excavated in 2017. Before results of the survey and excavations are described in more detail, a brief review will be given of Walter's previous surveying on the Arnavons.

5.3.1 Review of Previous Field Research

Archaeological surveying on the Arnavon Islands was initiated by Walter in 2010 as part of a collaborative research and conservation project between Southern Pacific Archaeological Research (SPAR) and The Nature Conservancy (TNC). TNC fund a turtle conservation programme that operate in the island group and commissioned SPAR's research as part of a package of cultural heritage initiatives focusing on the impacts of climate change and heritage development (Walter & Brooks 2014). With the exception of an article about the sourcing of an obsidian flake found during the 2017 excavation on the island group (Radclyffe *et al.* 2019), most of the published literature about the Arnavons is centred on its environmental history and turtle conservation (McKeown 1977; Hamilton *et al.* 2015; Albert *et al*. 2016).

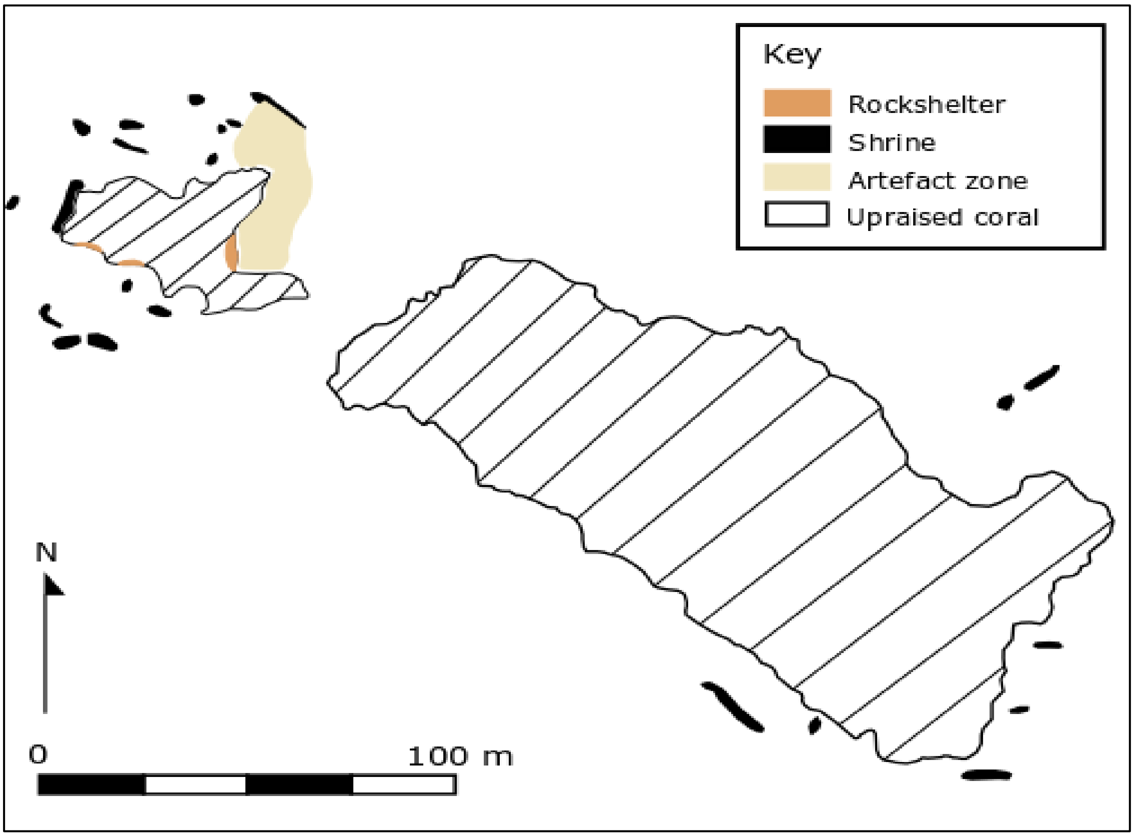


Figure 5.11 Map of site complex on Sikopo showing two large coral outcrops and location of rockshelters, shrines and artefact zone (map adapted from Walter & Brooks 2014: Fig. 4).

During his first visit in 2010, Walter identified surface ceramics, multiple shrine sites and rockshelters in a small interior portion of Sikopo (Figure 5.11). He returned there in August 2014 to undertake a more thorough survey of the island, during which he collected pottery samples from the artefact scatter. No excavations were carried out, although importantly the incised decoration of the pottery bore some resemblance to late Lapita assemblages from Roviana which suggested the site may have been occupied around 2000 years ago. An important aim of this study was to test this and recover a larger sample of pottery from the site which could be integrated into existing ceramic sequences for the Western Solomons. Furthermore, as the island group is positioned as a stepping-stone island between Isabel and Choiseul, the field research was also driven by the objective to examine evidence of interaction between communities across Manning Strait during prehistory.

5.3.2 SIK-1 Area A

The pottery scatter identified by Walter near the eastern edge of the smaller of the two coral outcrops on Sikopo was mapped in greater detail (Figure 5.12). It measured approximately 700 m² in size and a total of 339 sherds were collected from its surface. The pottery was found in its highest concentration near the eastern wall of the coral outcrop between two rockfall zones, which was named Area A. This portion of the eastern wall was slightly concave and created an overhang that served as a shelter.

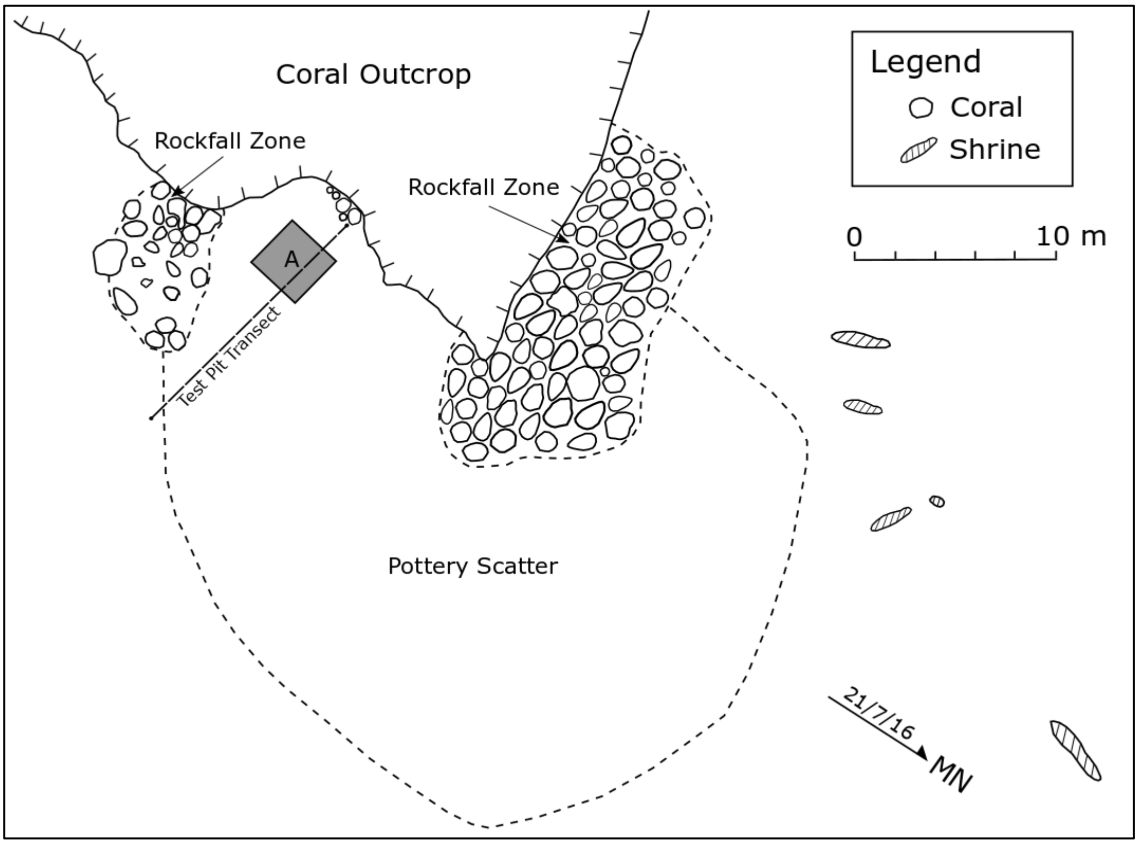


Figure 5.12 Plan of SIK-1 showing location of excavation square (Area A) and test pit transect, extent of pottery scatter and several coral mound shrines located north of the coral outcrop.

Beneath the overhang, burnt shellfish, fish bone belonging to the large Green Humphead Parrotfish known locally as *topa*, a chert flake, and a file and hammerstone made from Acropora coral were found. Surface pottery found further north of the overhang, which gradually sloped by a meter, was more widely dispersed. These sherds are likely to have washed down the slope from Area A.

To assess the vertical and horizontal extent of buried remains at Area A, eight spade pits were dug at 2 m intervals along a transect line which stretched from the face of the coral outcrop until the edge of the surface scatter. The stratigraphic profile exhibited an upper cultural layer of dark, friable soil and a lower greyish-white marine sand layer (Figure 5.13). Burnt Trochus and Tridacna shell were found at the base of the cultural layer at depths of 50-75 cm. Charcoal, pottery, chert flakes and fish bone were also found at variable depths in the cultural layer and in Test Pit 4, a notched Trochus shell fragment was recovered. Due to time constraints, only Test Pits 2, 4 and 6 were dug until the natural marine sand layer was reached. Test Pit 8 marked the eastern boundary of the site and contained only greyish-white sand and no cultural remains.

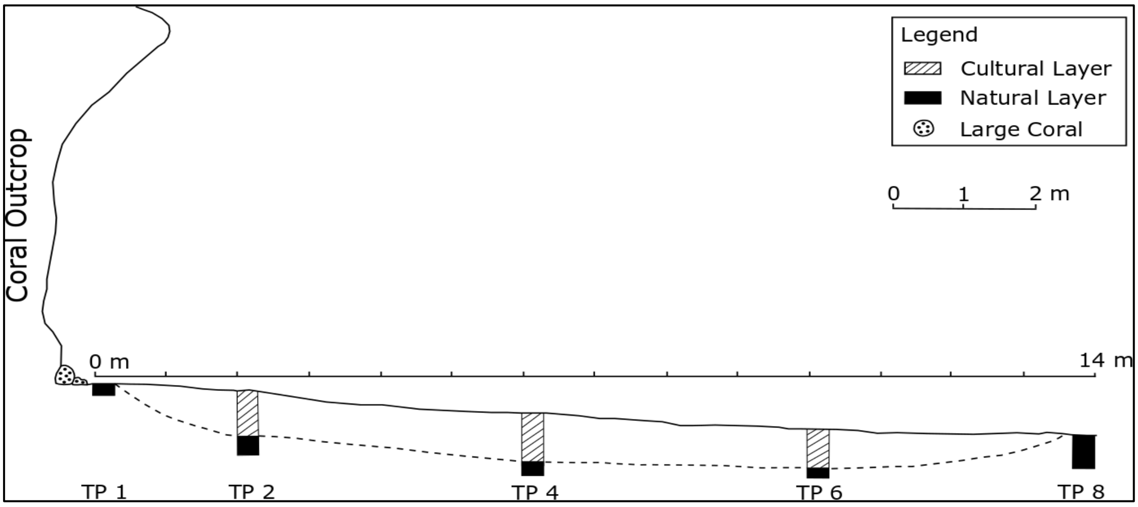


Figure 5.13 Stratigraphic profile of Area A.

Overall, the profile demonstrated that the stratified deposit extended between 10-12 m east from the face of the coral outcrop and appeared deepest near the outcrop. The position of the deposit beneath an overhang and the range of finds from the test pits and surface collection suggested the site was likely to have been utilised as a living space where food remains were discarded and shell-working was practised. It was difficult to ascertain the degree of disturbance of the stratified deposit from the test pits, although the consistent depth of the cultural layer suggested it was relatively intact. Following these initial assessments, it was determined the site should be systematically excavated to establish a more reliable understanding about the nature and timing of its occupation.

Excavation and Chronology

A 3 x 3 m excavation was conducted over eight days at Area A. The excavation square was placed two metres from the eastern face of the coral outcrop within the vicinity of Test Pit 2 where pottery was found at its greatest depth (Figure 5.12). The square was divided into nine 1 m^2 grid units (A-I) and was excavated in 10 cm spits. All artefacts were bagged except large quantities of Trochus and giant clam shell uncovered in the excavation which were counted and measured according to their associated spit and were then reburied in the square. Weighing on-site was not possible.

The stratigraphy consisted of a natural layer of marine sand at its base and two upper cultural layers formed of brownish black soil (Figure 5.14). Artefacts found on the surface of the excavation square included several pot sherds, a chert flake, and two large Acropora coral pieces used as a file and hammerstone. Layer 1 (0-80 cm) contained three sub-layers that were distinguished by their consistency, colour and the different features they contained. The middle and lower parts of the layer (1b and 1c) contained the highest density of faunal remains, namely large marine shellfish, fish and turtle bone, pottery, worked shell artefacts and lithics (Tables 5.2 and 5.3).

Table 5.2 Stratigraphic distribution of finds in Area A according to frequency.

Material Class	Layer 1a	Layer 1b	Layer 1c	Layer 2	Layer 3	Count
Pot sherds	54	285	141	6	3	489
Obsidian	-	1	-	-	-	1
Chert	9	23	16	-	-	48
Bone	6	2347	2694	311	375	5733
Shell*	16	790	204	10	8	1028
Total	85	3446	3055	327	386	7299

*Including sea urchin fragments

Table 5.3 Stratigraphic distribution of finds in Area A according to weight. Weight in g.

Material Class	Layer 1a	Layer 1b	Layer 1c	Layer 2	Layer 3	Tally
Pottery	75	594	200	7	3	878.5
Obsidian	-	0.1	-	-	-	0.1
Chert	50	48	17	-	-	114.7
Bone	1	580	362	31	33	1007.3
Shell*	377	136,554.5	24,284.8	330	241	161,787.2
Total	502.6 (0.5 kg)	137,777.5 (137.8 kg)	24,863.3 (24.9 kg)	368.3 (0.4 kg)	276.1 (0.3 kg)	163,787.8 (163.8 kg)

*Including sea urchin fragments

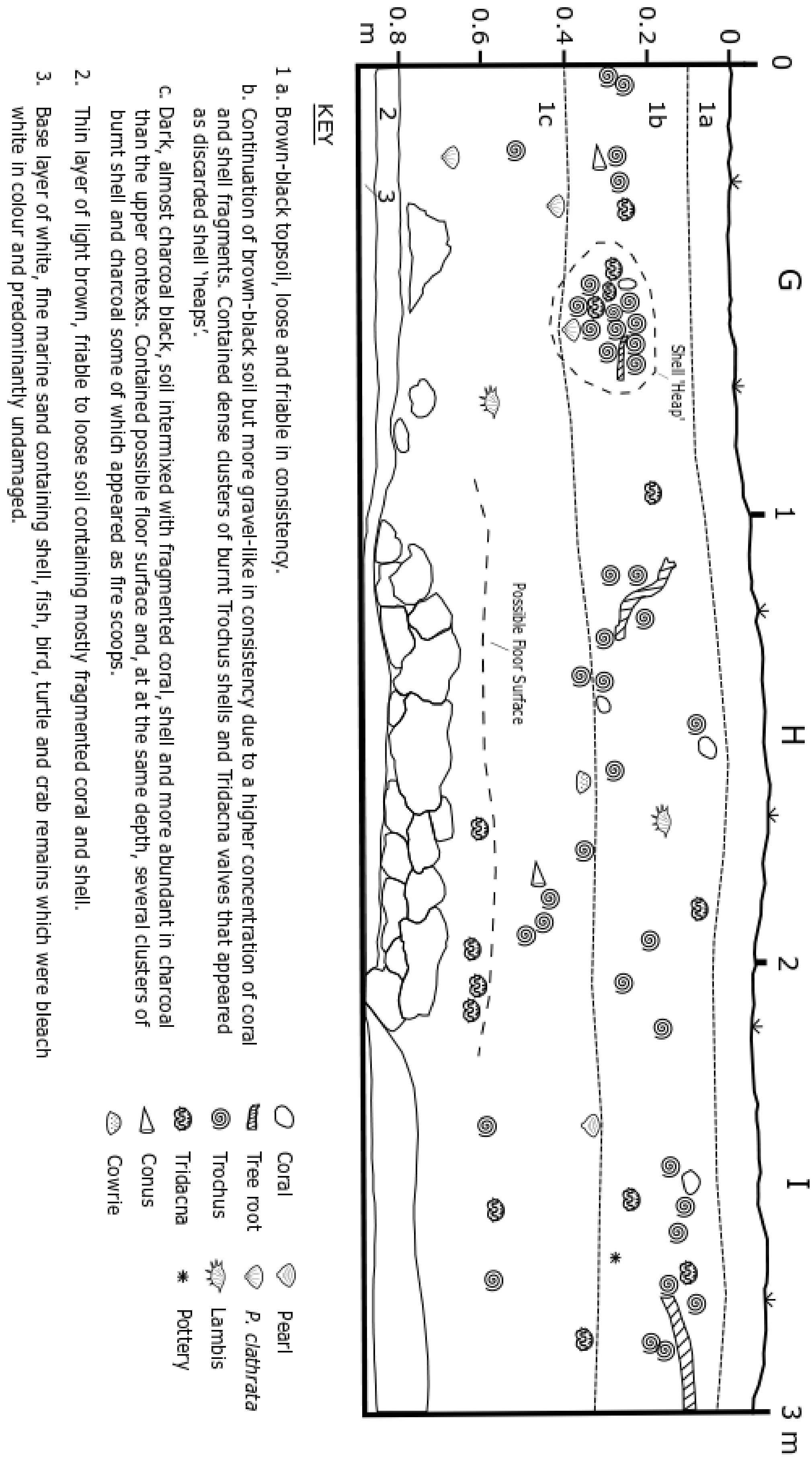


Figure 5.14 Eastern face of Area A excavation.

Layer 1a (0-10 cm) was a brownish black topsoil, loose and friable in consistency. There was extensive root disturbance visible, and a rat bone and several crab claws were found. Layer 1b (10-40 cm) was a continuation of the brownish black soil but was more gravel-like in consistency due to a higher concentration of coral and shell fragments. This layer contained dense clusters of burnt Trochus shells and Tridacna valves that appeared as discarded shell 'heaps' (Figure 5.15). Near the bottom of this layer, at a depth of about 30-40 cm, a small obsidian flake was found in grid square D.

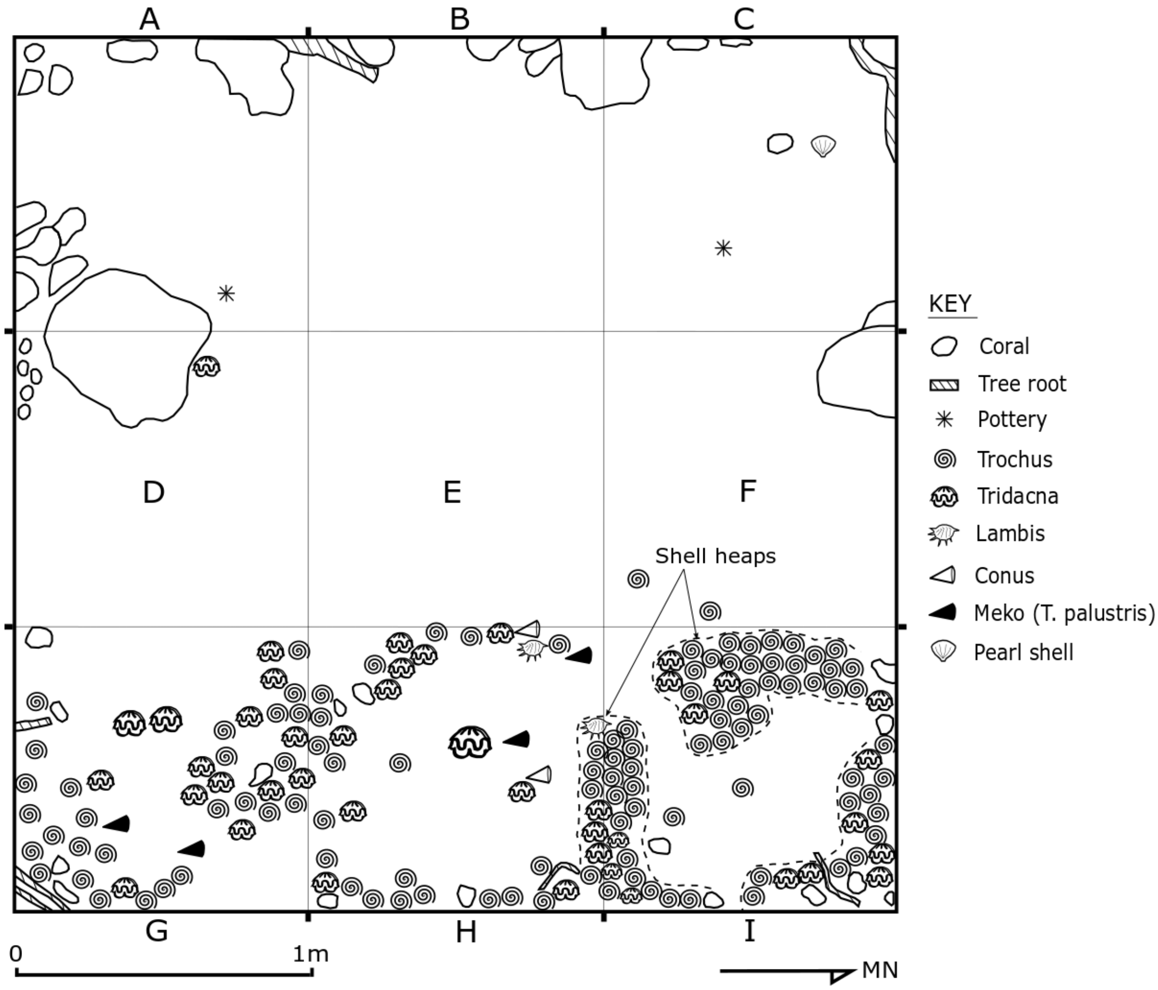


Figure 5.15 Plan drawn at 30 cm deep showing high density of shell appearing as 'heaps' in Layer 1b.

Layer 1c (40-80 cm) was a black soil intermixed with fragmented coral, shell and was more abundant in charcoal than the upper contexts. There was a noticeable decrease in the number of large shellfish in this layer and no shell heap features were distinguishable. A possible floor surface was identified at 65-70 cm deep in grid square H. This feature was very compact, created most likely from the ground being compressed against the underlying coral rock foundation. Multiple small clusters of burnt shell and charcoal were found at the same depth as the floor surface feature. Layer 2 (80-85 cm) was a thin layer of light brown, loose soil containing mostly fragmented coral and shell as well as fish, rat and turtle bone. Due to its position just above the natural marine sand layer, this layer was determined to be the beginning of a forest floor cover. Layer 3 (>85 cm), a fine white marine sand, contained a few pot sherds just below its surface but these were determined to be isolated admixtures from the upper cultural layers. Due to time restrictions, we were not able to dig deeper into the excavation square. But during initial test pitting, this layer was identified as natural and became completely sterile apart from sporadic shell from around 90-100 cm deep.

Seven charcoal and two shell samples recovered during the excavation and from initial test-pitting of Area A were submitted for AMS dating (Table 5.4). A burnt bivalve fragment and unidentifiable wood charcoal were selected from Layer 2 to obtain an age for the bottom of the cultural deposit. Two nutshell fragments and an unidentified wood charcoal fragment were sampled from Layer 1c, one of these (OZX437) from a cluster of charcoal found on top of the possible floor surface feature. Two nutshell fragments, strongly resembling coconut, were sampled from the shell heap features identified in Layer 1b. One of these Layer 1b samples (OZY103), produced an earlier than expected calibrated age range which suggested it may have been displaced from Layer 1c.

Table 5.4 Radiocarbon dates produced from excavations of Area A (SIK-1), Sikopo. Calibrated age range and median determined using Oxcal 4.3.

Lab Code	Material	Unit	Layer	Depth (cm)	Uncal. C14 Age	CalBP Range (2 sigma)	CalBP Median
OZX440	Wood	I	2	80-90	900 ± 25	911 (45.4%) 841 835 (50%) 741	830
OZX441	Shell	H	2	80-90	1,055 ± 25	669 (95.4%) 555	628
OZX439	Nut	G	1c	70-80	855 ± 30	900 (7.4%) 867 824 (1.1%) 815 800 (86.8%) 692	760
OZX438	Nut	H	1c	70-80	805 ± 25	761 (95.4%) 680	714
OZX437	Wood	H	1c	60-65	845 ± 25	793 (95.4%) 694	751
OZX442	Nut	I	1b	30-40	540 ± 25	631 (24.9%) 600 560 (70.5%) 516	544
OZY103	Nut	F	1b	30-40	700 ± 25	686 (83.2%) 647 585 (12.2%) 566	665
OZX436	Wood	TP4	-	50-60	565 ± 25	640 (53.2%) 590 564 (42.4%) 528	600
OZX435	*T. niloticus*	TP4	-	50-60	1,025 ± 25	652 (95.4%) 542	601

A paired sample were selected from Test Pit 4 following the extraction of an unidentifiable charcoal wood fragment (OZX436) from the flotation of a *Trochus niloticus* shell. This was done to assess what calibrated age ranges would be produced from these two materials and the results demonstrated close overlap between their age ranges. From this, it was determined that the shell sample (OZX441) found in Layer 2, which produced a younger calibrated age range than the wood charcoal found in the layer, is likely to have moved from higher in the deposit. A delta R (ΔR) value of '0' was used as the few available ΔR values for the Western Solomons (Vella Lavella and Bougainville) were considered unsuitable. These were calculated using different shellfish species collected from older volcanic and continental underlying geologies (Petchey *et al*. 2008a: Table 1).

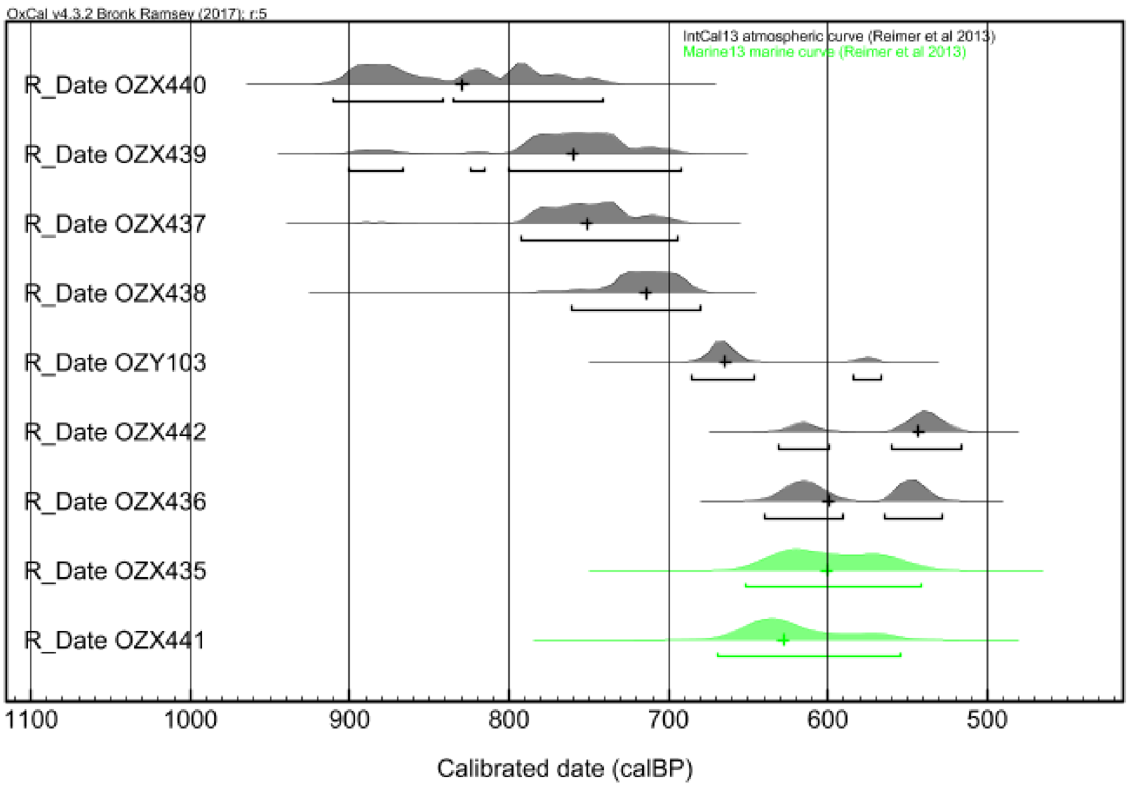


Figure 5.16 Plotted radiocarbon sequence of prehistoric occupation of Area A, Sikopo. 2 sigma (95.4%) ranges and '+' indicates median.

Overall, the radiocarbon results and features identified in the stratigraphy demonstrated two phases of prehistoric occupation of SIK-1 (Figure 5.16). The first dates to between 825-700 calBP and is associated with the floor surface feature and nearby small clusters of charcoal and burnt shell identified in Layer 1c. The second dates to 625-500 calBP and is associated with the cooking and discarding of large quantities of shell that formed 'heaps' which were identified in Layer 1b. Continuous semi-permanent occupation of the site between approximately 825-500 calBP cannot be entirely dismissed. However, the dating and stratigraphic evidence as well as differences observed in artefact density between Layers 1b and 1c suggest it is more likely that SIK-1 was occupied intermittently over two separate phases of occupation.

5.3.3 SIK-2 Lianga Tafa

A large rockshelter carved into the northern end of the coral outcrop adjacent to Area A was investigated (Figure 5.17). We named the site Lianga Tafa which translates to “big cave” in the Isabel language Cheke Holo. It possessed no surface finds and its stratigraphy was shallow. Three test pits were placed on a raised coral shelf within the cave, and two near the mouth of the cave (Figure 5.18). The stratigraphy of the inner cave consisted of an upper layer of golden-brown sand, and a lower layer of fine, white marine sand blanketing a coral bedrock base.

Figure 5.17 Photograph of Lianga Tafa (“big cave”) (SIK-2).

Test Pits 1 and 4 were dug to depths of 20 cm where the coral bedrock was reached. They contained crab shell and bat bone fragments, and a few fish vertebra and charcoal flakes. In Test Pit 5, the coral bedrock was reached at 40 cm. It contained five plain pot sherds found at around 30-35 cm deep within the upper golden-brown sand layer. Other finds included fish bone, a water-rolled chert fragment, bird bone, and three charcoal fragments found approximately 30-40 cm deep. No radiocarbon dating was carried out, however, examination of the fabric of the plain sherds demonstrated close similarities with the dated pottery from Area A. This suggested the sherds were probably deposited in the cave during the occupation of SIK-1.

Test Pits 2 and 3 were dug to depths of 50 cm and exhibited a similar stratigraphic profile. This comprised an upper layer of brownish black soil (0-30 cm) and a lower layer of white gravelly sand (>30 cm). Only coral and shell fragments were found, and none of the shell appeared worked or modified in any way.

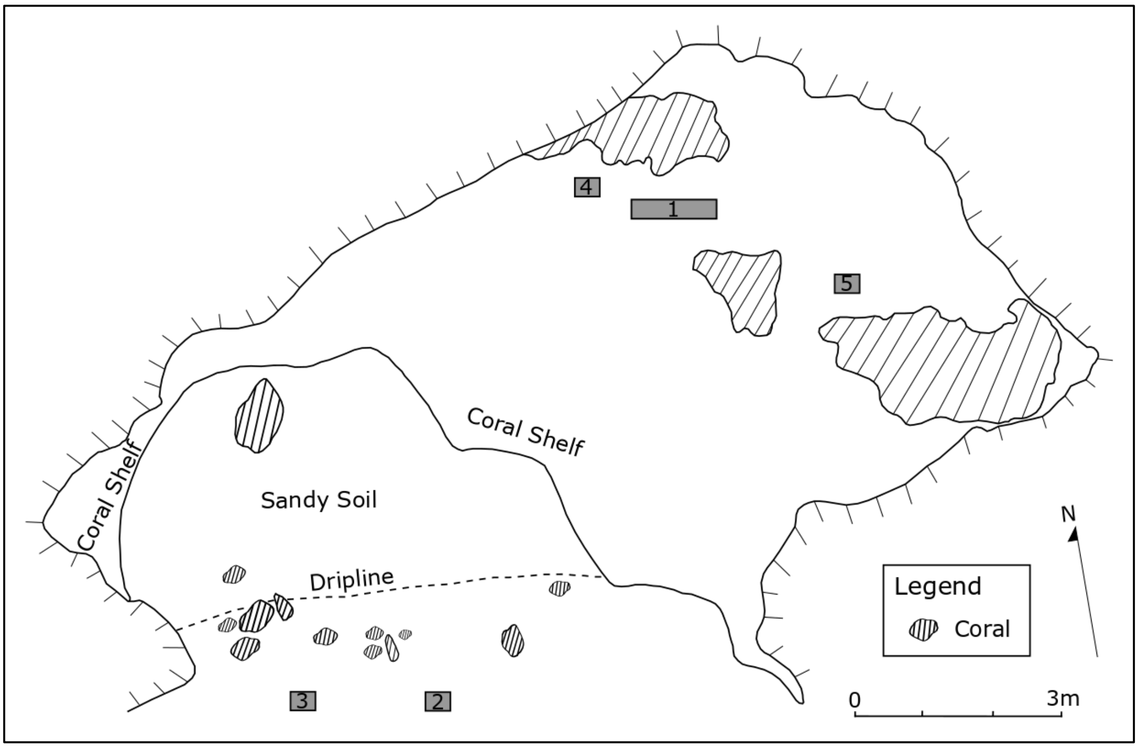


Figure 5.18 Plan of Lianga Tafa and associated test pits.

5.3.4 SIK-3 Shrine complex

A total of 22 shrines were recorded in the interior of Sikopo: 15 surrounding the coral outcrop near Area A and seven near the eastern edge of the second, larger coral outcrop located about 150 m southeast of Area A (Figure 5.11). They appeared as low mounds of stacked coral which were oval or rectangular in structure and ranged from 0.2-1 m in height. They contained remains of mainly large shell species which were intermixed among the stacked coral or sat on top of the mounds (Figure 5.19).

Natural coral formations were occasionally seen in the island’s interior and it is likely that some of these were used as shrines with coral and shellfish offerings placed on them. The appearance and contents of the Sikopo shrines align with the construction of Roviana-style coral mound shrines dated to within the last 400 years in the New

Georgia group (Sheppard *et al*. 2000; Thomas 2014). Therefore, it is possible the entire shrine complex was gradually constructed near the end of the second phase of occupation of Sikopo. It is also likely that some of the shrines were built in the last two centuries during visits made by Roviana head-hunting parties who travelled to the Arnavons to obtain tortoiseshell.

Figure 5.19 Coral mound shrine on Sikopo.

Shell offerings were the most common find associated with the shrines. These included large blocks of the hinge of *T. gigas* which suggested some of the shrines may have been dedicated to the manufacturing of prestige shell valuables. Another likely function of some of the shrines was to grant success in shell-fishing as has been documented in the New Georgia group (Nagaoka 1999; Walter *et al*. 2004; Thomas 2014). On one of the shrines, Shrine F33, seven thick plain pottery sherds were found which were identified to belong to the same vessel. Examination of the sherds suggested that part of the vessel was placed on the shrine, most likely as an offering, then shattered naturally or was deliberately fragmented before being deposited. The shrine was the largest one identified within the site complex and, in addition to the pot sherds, it contained on its surface a large coral slab most likely used as an anvil, approximately 118 giant clam shell fragments, most of which were complete valves, and 32 Trochus shells (Figure 5.20). Interestingly, geochemical analysis of the plain sherds demonstrated them to be distinct from pottery recovered in Area A, and this is discussed in Chapter 7.

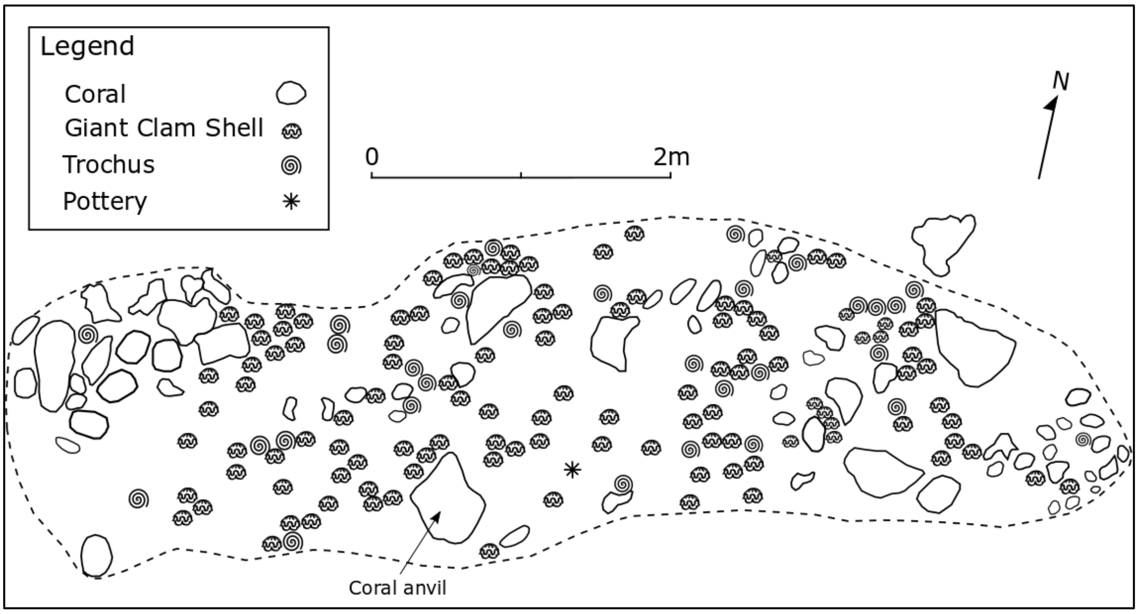


Figure 5.20 Plan of Shrine F33.

5.4. Choiseul Sites

Three episodes of fieldwork were carried out in southeast Choiseul. The first was a preliminary two-week visit in August 2017 to Wagina, Rokoso and Nuatambu to meet community leaders and explain my research intentions (Figure 5.21). During the visit, reconnaissance surveys were conducted over four days on Laena Island and over six days on Wagina.

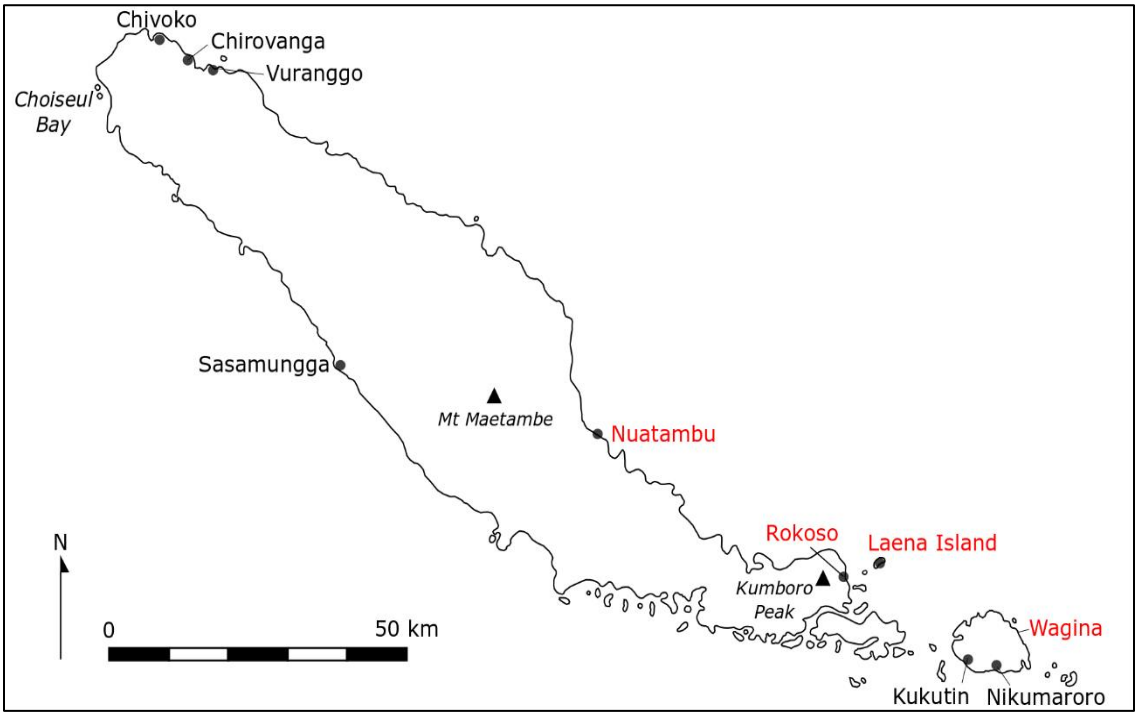


Figure 5.21 Map of Choiseul showing location of villages and areas mentioned in text. Sites investigated in this study in red.

My second visit to Choiseul, which took place over January and February 2018, involved excavations at Nuatambu, Wagina and Laena Island. Excavations at Nuatambu were unfortunately disrupted due to disagreements between local chiefs, and all artefacts collected at the site were not able to be included in this study. The third field trip was carried out over 10 days in January 2019 and was centred upon surveying for pre-ceramic occupation of rockshelters on Wagina. Before the results of this fieldwork can be presented, it is important to first review previous archaeological surveying that has been carried out on Choiseul and provide further context to the reasoning behind the selection of sites that were investigated in this study.

5.4.1 Review of Previous Archaeological Studies

The earliest archaeological fieldwork carried out on Choiseul was in 1964 by Chikamori (Itoh and Chikamori 1965). As was described in Chapter 4, most of his time on Choiseul was spent documenting oral histories and traditional practices including pottery-making in Chirovanga and nearby villages in the northwest of the island. He did carry out an excavation, however, of Sirebangara Cave located near Vuranggo where he recorded a surface scatter of pottery and a petroglyph of a human figure wearing earrings (Chikamori 1965). Few artefacts were found in the excavation, and Chikamori did not describe the surface pottery in any more detail nor date the site. His description of the petroglyph, however, which resembles human figures carved on traditional Choiseul monoliths known as *dolo* may suggest the surface pottery and petroglyph date to within the last few centuries.

More comprehensive site surveying was conducted in southeast Choiseul between December 1977 and January 1978 by Miller as part of the NSS programme (Miller 1979). His fieldwork involved a very brief visit to Laena Island where he recorded a single ridgetop site containing nut anvil stones. Most of his time, however, was spent on Wagina where he surveyed for several days and at Nuatambu where he carried out a small excavation. On Wagina, he recorded a wide range of sites including rockshelters, burials and surface scatters of mainly plain but some incised pottery. Importantly, he gathered from local informants that the "island was uninhabited throughout the period of recorded history" and that "early inhabitants [had been] exterminated or driven away by Roviana head-hunters" (Miller 1979: 61). A key objective of carrying out further field research on Wagina as part of this study was to record further archaeological evidence of the historical prevalence of head-hunting on Wagina.

Additionally, precedence was also given to locating more ceramic sites and investigating rockshelters which could be dated to provide further insight into earlier prehistoric occupation of the island.

Miller was drawn to investigate Nuatambu due to extensive oral traditions associated with the islet and its repute as the 'birthplace' of kesa (Scheffler 1965; Piko 1976). During his brief survey, this depiction of the island was substantiated by the presence of dense surface scatters of worked shell and pottery on the surface of the islet (Miller 1979). He carried out a 1 m^2 excavation at the site and, significantly, it revealed a 1.8 m deep stratified deposit that was rich in pottery, faunal remains and worked shell artefacts. Within the stratigraphy, he identified several hearths and two consecutive house-floor layers which indicated sequential, most likely, permanent occupation of the islet. No radiocarbon dating was carried out. However, Miller (1979: 78) argued from his examination of stylistic changes observed from the stratigraphic ceramic sample that the pottery-making tradition in this part of Choiseul may be "as old as that of the Shortland [Islands]", which dates to 1040 ± 95 BP (Irwin 1972: 100).

No subsequent archaeological fieldwork had been carried out on Nuatambu since Miller's preliminary work. However in 2008, Rhys Richards, ex-New Zealand High Commissioner to Solomon Islands, visited the island and collected pottery from the site (Richards 2011: 139). Interestingly, he reported that one sherd he found was described to be a possible late Lapita sherd by Roger Green, Matthew Felgate, Peter Sheppard and Glenn Summerhayes. It was noticeably heavier and thicker than the rest of the pottery and it was decorated with "a very different motif of tongue-shaped curved lines" (Richards 2011: 139). Both Miller and Richards' findings from their visits to Nuatambu were significant as they demonstrated some of the earliest archaeological evidence of the prehistoric settlement of Choiseul. An important objective of revisiting Nuatambu in this study was to re-excavate and radiocarbon date the site to provide a more resolute chronology of the prehistoric occupation of the islet and the pottery-making tradition of this part of Choiseul. In addition, it was intended that worked shell artefacts recovered in excavation and during surface surveys could be analysed to assess evidence of the manufacturing of kesa and other traditional Choiseul shell valuables.

Overall, archaeological field research previously carried out on Choiseul has provided very limited insight into the prehistoric settlement of the province. Crucially, few excavations and no radiocarbon dating had been carried out on the island prior to this study. Moreover, assessments of the antiquity of key archaeological sites, namely Nuatambu and Wagina, were based solely on oral historical information or stylistic comparisons of pottery collections. Therefore, it was imperative that the fieldwork carried out in southeast Choiseul as part of this study provided a more robust chronological framework for the prehistoric settlement of this part of the Western Solomons. Some insight into the historical development of exchange networks in Choiseul has been given by Chikamori (Itoh and Chikamori 1965) and other ethnographic accounts described in the previous chapter (Craven 1976; Guppy 1887). Although it is not possible to derive a reliable understanding from these accounts about the prehistoric origin of these trade networks and how they transformed from the initial late Lapita settlement of the Western Solomons. This is discussed further at the end of this chapter following a presentation of the findings from the surveys and excavations carried out at Wagina, Laena Island and Nuatambu.

5.4.2 Wagina

Eleven sites were recorded on Wagina and four on two offshore islands, Tekuae Island and Gideon Island (Figure 5.22). Surveying was undertaken with the assistance and guidance of Gilbertese villagers from Kukutin, one of two Gilbertese villages located on the southern coast of the island. It was found from surveying and descriptions given by my informants who regularly fish, hunt for turtle and tend to seaweed farms in the coastal waters surrounding Wagina that head-hunting period burials often appeared on offshore islands. Whereas a wider range of sites were present on Wagina and included rockshelters, cave burials, surface scatters of pottery and chert, hillforts, and shell ring caches and shrines constructed from coral slabs and cobbles.

Only two sites on Wagina were excavated. The first was WAG-10, a small limestone overhang located approximately 1.3 km southeast of Kukutin which contained a plain pot sherd and two chert flakes on its surface. Two spade pits were dug beneath the overhang and revealed only a few fragments of shell and charcoal before limestone bedrock was reached at 60 cm. It was decided from the lack of finds that the site was not worth dating. The second excavated site was a much larger and more informative rockshelter site named Fly Cave (WAG-4). This site was the only archaeological site on Wagina that was radiocarbon dated. Attention will be given in this summary of findings from field research carried out on Wagina primarily to describing the excavation and chronology of Fly Cave. Additionally, focus will be placed on describing key ceramic sites (WAG-11 and WAG-12) and head-hunting period burial and cave sites (WAG-5, WAG-7 and WAG-8) that were recorded to showcase the known range of prehistoric to historic occupation of Wagina.

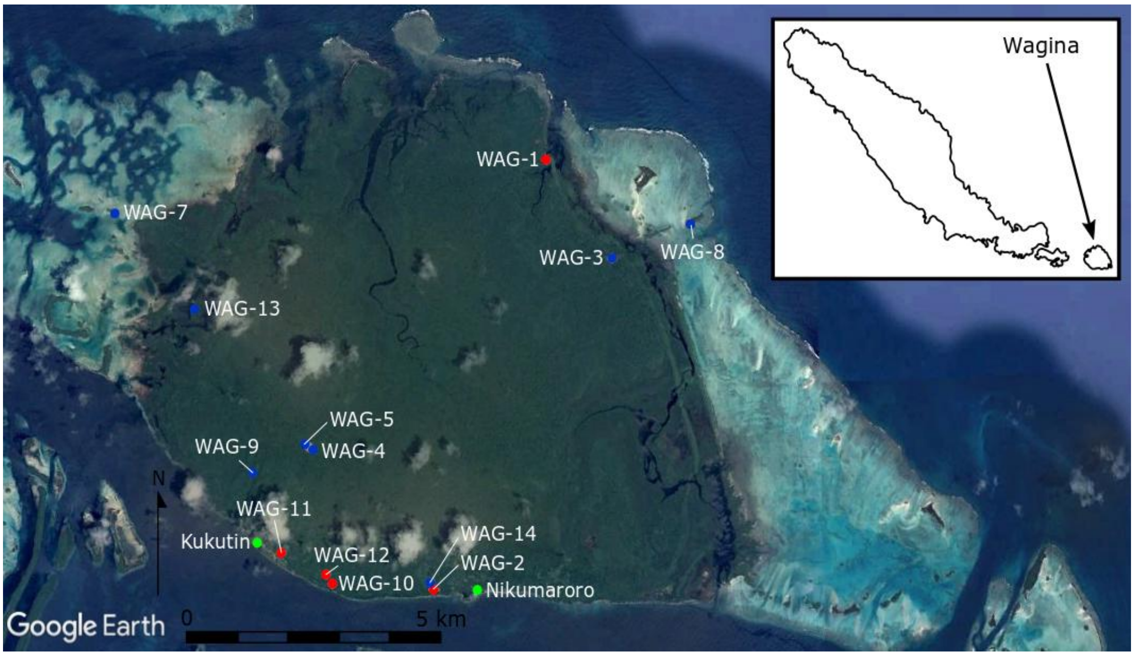


Figure 5.22 Map of Wagina and offshore islands showing the locations of recorded sites. Red circles = ceramic scatters; blue = aceramic; green = modern villages.

WAG-4 Fly Cave

Fly Cave is located about 1.5 km northeast of Kukutin and was named after black flies which lay their larvae in the loose topsoil of the cave floor. It was shown to me by local Gilbertese guides who occasionally rested in the cave when pig hunting in the interior of Wagina. It was large and tunnel-like, measuring about 5 m high at its entrance and 5 m wide at its centre (Figure 5.23). Along its western edge were found small clusters of mangrove clam shells and Trochus as well as scattered pig bone. No pot sherds were found although my guide described to me that when it was visited in the 1950s, it contained part of a clay pot on its surface located near the pig bone scatter. From this initial inspection, and due to the geomorphological setting of the cave – namely its large size and high elevation (~20 m asl)[7] – the site was considered worth excavating.

During the first visit to the cave in August 2017, four spade pits (SP1-SP4) were dug to assess the stratigraphic profile of the site (Figure 5.23). The first spade pit was placed in the centre of the cave and was excavated to a depth of 1.2 m where it appeared that the limestone bedrock had been reached. The pit exposed 11 layers of variably

[7] Highest elevation on Wagina is approximately 40 m asl (Hansell and Wall 1976: 5).

compacted layers of soil and three approximately 3-5 cm lenses of calcite. No artefactual evidence was recovered apart from specks of charcoal found between 25-90 cm deep. The three other spade pits, which were placed near the southern mouth of the cave within the surface scatter of shellfish and at the northern mouth of the cave near the pig bone scatter, were dug to no deeper than 65 cm due to time restrictions. They revealed a similar stratigraphic profile as the upper half of SP1 and produced only a few shell fragments. In January 2019, a larger team led by Walter and I revisited the site and we carried out a more systematic excavation.

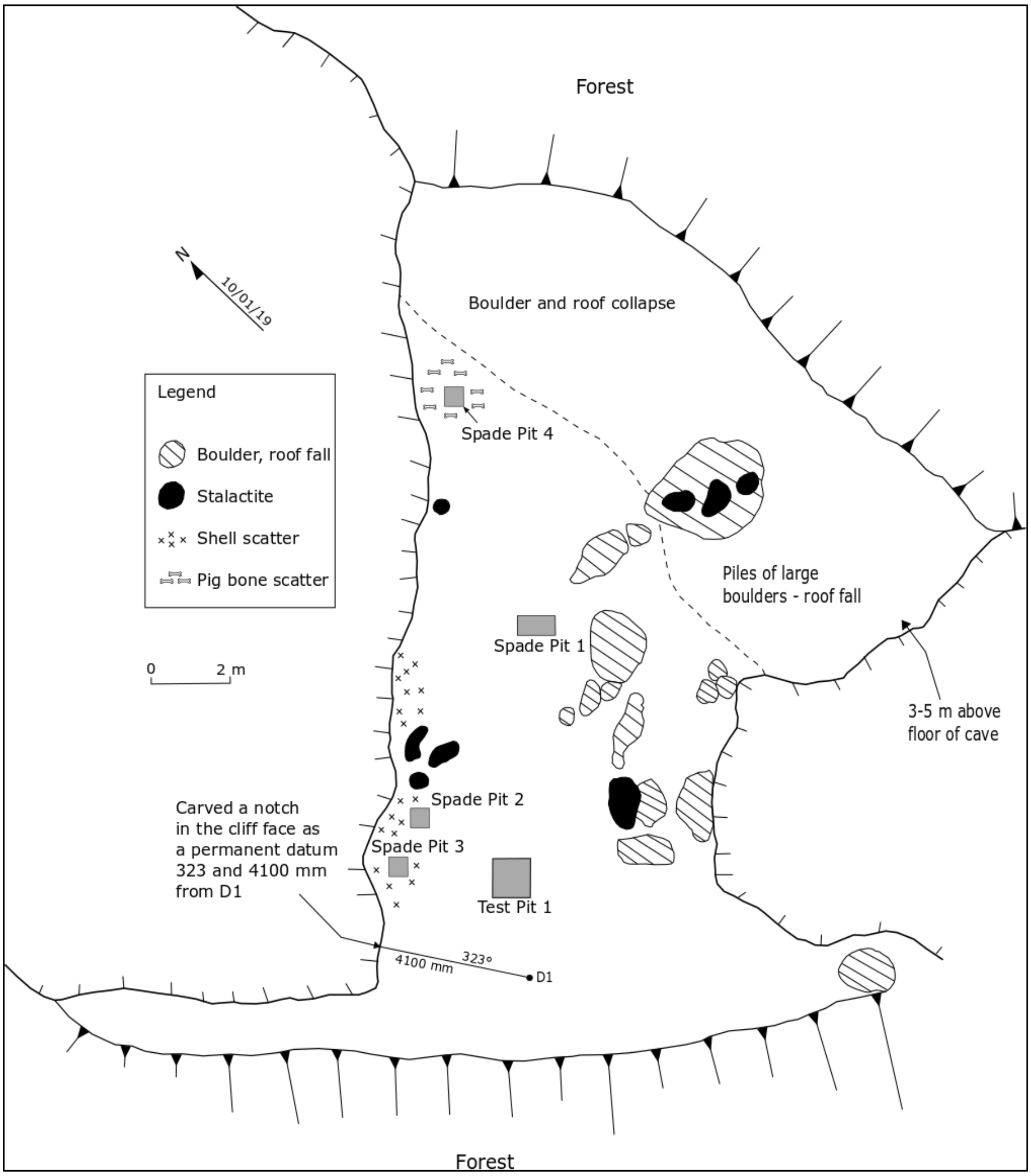


Figure 5.23 Plan of Fly Cave (WAG-4), Wagina, showing location of 2016 spade pits and 2019 test pit.

Excavation and Chronology

A 1 x 1 m excavation, Test Pit 1, was dug over three days at Fly Cave. The square was placed at the centre of the southern mouth of the cave below its dripline (Figure 5.23). This area was selected as it was well-lit, and it was considered likely that food scraps consumed within the cave were likely to have been swept towards there. The test pit was excavated in 20 cm spits using spade and trowel and was dry sieved. The stratigraphy consisted of ten layers underlain by a blueish white limestone bedrock which seeped water through its cracks at a depth of about 2.5 m (Figure 5.24).

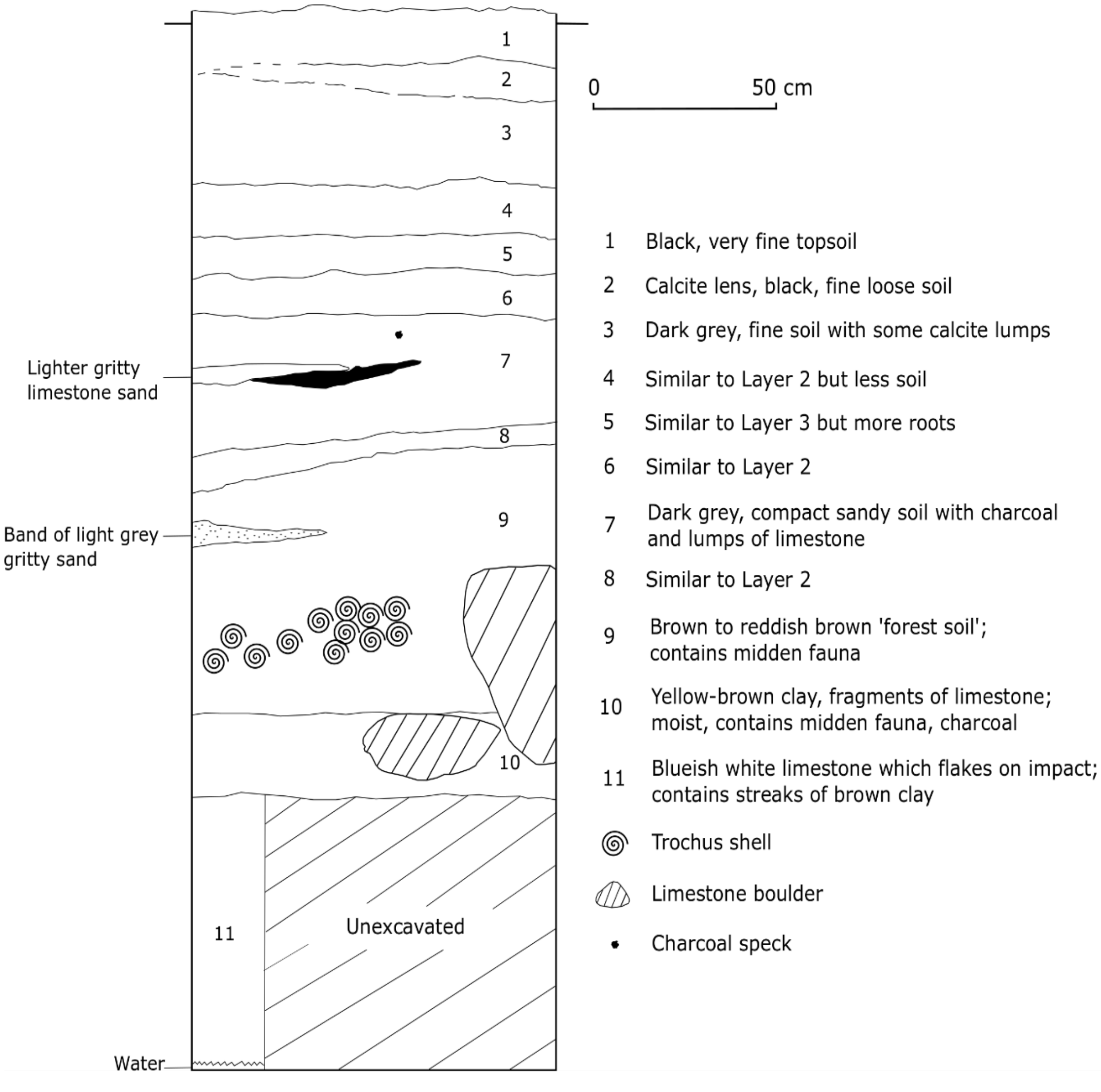


Figure 5.24 Northern section of Test Pit 1, Fly Cave (WAG-4).

Some faunal remains were found in the upper three loose soil layers (Layers 3, 5 and 7) in the first metre of the test pit (Tables 5.5 and 5.6). A few fragments of fish, mammal and turtle bone were found in Layer 3 (20-40 cm). In Layer 5 (50-58 cm), fragments of Tridacna shell and unidentifiable gastropod shell fragments were recovered. Layer 7

(70-92 cm) contained a thin lens of charcoal and a slightly denser concentration of shell fragments. These belonged mainly to the mangrove clam, *Polymesoda*, and *Hippopus*.

Table 5.5 Stratigraphic distribution of finds at Fly Cave according to frequency.

Material Class	Layer 3	Layer 5	Layer 7	Layer 9	Layer 10	Count
Bone	6	-	-	153	91	250
Shell	16	5	11	780	112	919
Pumice	-	-	-	-	1	1
Shell ring?	-	-	-	-	1	1
Total	22	5	11	933	205	1171

Table 5.6 Stratigraphic distribution of finds at Fly Cave according to weight. Weight in g.

Material Class	Layer 3	Layer 5	Layer 7	Layer 9	Layer 10	Tally
Bone	0.6	-	-	54.6	29.7	84.9
Shell	11.5	14.3	54.3	1828.5	342.9	2237
Pumice	-	-	-	-	0.5	0.5
Shell ring?	-	-	-	-	1.5	1.5
Total	12.1	14.3	54.3	1883.1	372.6	2322

More substantial amounts of midden, comprised mainly of Trochus, Tridacna and mangrove shell species, fish, bird and mammal bone, were recovered between 1.2 to 1.3 m in Layer 9 (100-160 cm). This layer, which appeared as a reddish-brown layer of forest soil, contained a cluster of discarded Trochus shell that was surrounded by intermittent specks of charcoal. Below this dump of Trochus, in Layer 10 (160-180 cm), charcoal and faunal remains were also recovered but in less abundance. This yellow-brown clayey layer contained a possible Trochus shell ring fragment and a small piece of pumice that exhibited a ground facet. Further information about the faunal remains recovered during the excavation is given in Chapter 9.

Three charred nutshell fragments and one shell sample recovered in the sieve during the excavation of Test Pit 1 were submitted for AMS dating (Table 5.7). One sample was selected from Layer 10 and three from near the base of Layer 9 where the Trochus shell dump was found. These layers were sampled to ascertain the earliest occupation of the cave. As Wagina is an uplifted coral island and many gastropods, including Trochus, can produce ages that reflect the ingestion of ancient limestone (Petchey *et al*. 2008b), the hinge of a pearl oyster shell, belonging to either *Pinctada margaritfera* or *P. maxima*, was selected to be dated.

Table 5.7 Radiocarbon dates produced from excavations of Fly Cave (WAG-4), Wagina. Calibrated age range and median determined using Oxcal 4.3.

Lab Code	Material	Unit	Layer	Depth (cm)	Uncal. C14 Age	CalBP Range (2 sigma)	CalBP Median
WK-49136	Nut	TP1	11	180-190	2207 ± 12	2309 (12.9%) 2285 2278 (40.2%) 2220 2212 (42.3%) 2152	2233
WK-49137	Nut	TP1	10	170-180	2212 ± 14	2311 (11.3%) 2291 2275 (84.1%) 2153	2226
WK-49138	Nut	TP1	10	170-180	2182 ± 15	2305 (65.3%) 2233 2205 (1.0%) 2199 2184 (29.1%) 2129	2260
WK-49270	*Pinctada* sp.	TP1	10	170-180	2432 ± 15	2135 (95.4%) 1995	2071

A ΔR value of '0' was used in the calibration of the shell date, as was practised for the dating of SIK-1 on the Arnavon Islands, because the few available ΔR values for this part of the Solomons were considered unsuitable (listed in Petchey *et al*. 2008a: Table 1). The resulting calibrated age range of the shell sample was considerably younger than the charcoal specimens. It is likely, however, that had the correct ΔR value been applied, the shell sample would have resulted in a similar calibrated age range as the charcoal dates. This is supported by recent research carried out in the Pacific which has demonstrated that calibrating a shell date with a ΔR of 0 will result in a calibrated age that is too young at this particular time in the region's prehistory (Petchey 2020).

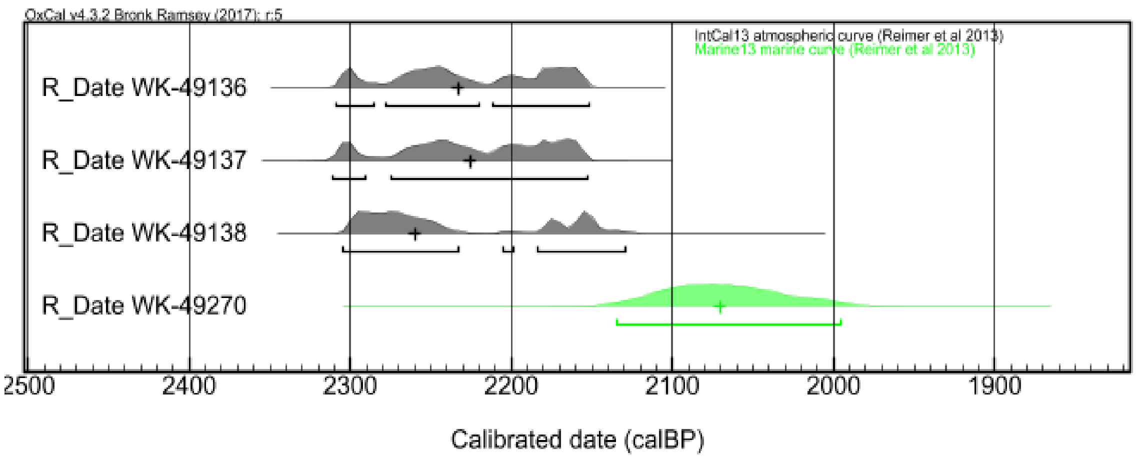


Figure 5.25 Plotted radiocarbon (C14) sequence of prehistoric occupation of Fly Cave, Wagina. 2 sigma (95.4%) ranges and '+' indicates median.

In summary, the radiocarbon results demonstrated Fly Cave was first inhabited between 2300-2150 calBP (Figure 5.25). The overlapping ranges of the charcoal dates and the low density of faunal remains recovered in layers 9 and 10 suggest that it was inhabited for a short period of time and by a small population, perhaps a single family or small group of inland foragers. Further excavations are planned to be carried out at the site to gain a more comprehensive understanding of the duration and nature of the prehistoric occupation of cave sites on Wagina.

WAG-11 Koura's Garden

The largest surface scatter of pottery and chert (WAG-11) recorded on Wagina was found on part of a ridgeline that runs northwest to southeast behind Kukutin (Figure 5.22). The site measured approximately 250 m^2 and was named after the owner of the garden upon which the artefacts were found, Kouramwemwe. A total of 485 sherds, 100 chert flakes and four chert cores were collected from the site.

Figure 5.26 Photograph of Koura's Garden, facing Wagina's southern coastline.

The decoration of the pottery, which exhibited affinities with Shortland Islands Middle Period Ware dated to after 1040 ± 95 BP (Irwin 1972), suggested the pottery and chert artefacts were discarded at the site within the last millennium. Further insight into the estimated age of the site was provided by the presence of a low coral mound shrine located adjacent to the scatter. Surface artefacts found on the shrine included a few similarly decorated pot sherds as well as a two shell rings that resembled the shell money rings, *ziku* and *hokata*, which originate from Choiseul and Roviana, respectively.

It was, therefore, determined from the style and contents of the shrine that the site most likely dates to within the last four centuries.

Today, the ridgeline is exploited by Kukutin villagers as a productive gardening zone and freshwater is easily attainable from nearby streams and waterholes. In the past, it is likely the area was used in a similar manner and was the site of a village or hamlet. Moreover, an advantage of settling ridgelines over the flatter coastal regions of southern Wagina was the vantage point provided by the high ridgeline to scan the sea for incoming head-hunting raiding parties (Figure 5.26).

WAG-12 Eriton Stone

Another large pottery scatter, which comprised 459 sherds exhibiting similar stylistic affinities as the previous ceramic site, was discovered on a hilltop located east of Kukutin (Figure 5.22). The site was named after the owner of a nearby garden, Eriton, from Arariki, a communal sector of eastern Kukutin, and a large roughly circular coral outcrop ('stone') upon which the site was situated.

Figure 5.27 Photograph of Eriton Stone hilltop.

From the hilltop, the ocean and southern coastline of Wagina were visible and the edges of the hill were steep which would have served well as a defence against head-hunting parties. Artefacts were visible around the entire circumference of the coral outcrop as well as on the hilltop where an approximately 10 m² flatland had once been used as a burial place or hiding place for what would have been a large horde of shell valuables. This was indicated by the presence of broken pieces of shell rings and numerous large flat coral slabs (Figure 5.27).

The site was clearly disturbed, and I was informed that robbers had stripped the site of shell valuables within the last few decades. Other archaeological remains identified at the site included a chert flake, several complete fishing net weights called *bareke*, fish and turtle bone, shellfish remains, and an adze bevel fragment manufactured from *T. maxima*. Overall, similarities observed between the shell artefacts and pottery collected at Eriton Stone (WAG-12) and Koura's Garden (WAG-11) suggested that both sites were occupied at around the same time, most likely within the last four centuries.

WAG-7 Tekuae Island & WAG-8 Gideon Island

Burial sites were identified on two small coral islands, Tekuae Island and Gideon Island, located off the western and northern coasts of Wagina (Figure 5.22). They were typically found within coral limestone caves and involved the placement of crania and long bones from lower and upper appendages on a flat coral shelf hidden within the cave or on the outer edge of an upraised coral outcrop (Figure 5.28). It was also common for the burials to be well-hidden and difficult to access which suggested the deposited human remains were placed there to be undisturbed.

Figure 5.28 Photo of head-hunting period burial located above the eastern cliff face of Gideon Island.

On Gideon Island, bones belonging to at least six individuals were found in a cave located in the eastern cliff face of the island. No other artefacts were found alongside the remains. On Tekuae Island, one of the three burials recorded there contained fragmented gin bottle glass. The presence of European artefacts indicated that the burials found on Tekuae Island and probably for those found on Gideon Island and other offshore islands around Wagina date to within the last 150 years. In addition, the selection of offshore islands and not the likely birthplaces of the buried suggests the bodies belonged to victims of a rival head-hunting party (c.f. Thomas 2003: 110). More detailed examination of skeletal remains found on these offshore islands to assess evidence of trauma would improve upon this understanding.

WAG-5 Sarumbangara Cave

Inland behind Kukutin, a burial containing limb bones, a single skull and two shell fretworks, known traditionally in Avaso as *sarumbangara*, was recorded (Figure 5.29).

Figure 5.29 Human skeletal remains and two shell fretworks ('sarumbangara') recorded at burial in Sarumbangara Cave (WAG-5).

In contrast to the head-hunting period burials identified on Tekuae Island and Gideon Island, it was considered likely that WAG-5 was the burial place of an indigenous inhabitant of Wagina who possessed an ancestral connection to the land. This was supported by the presence of sarumbangara in the burial which has been described to have never traditionally been used as a medium of exchange but served more likely as a possession to bring into the afterlife as well as to represent entitlement to land (Piko 1976: 104). Therefore, it is likely the individual was buried by kin as opposed to rival head-hunters depositing their sacrificial victims' bones. No pottery was found at the site which could assist in estimating the age of the site. Although the presence of the shell fretworks suggests the burial dates to sometime within the last millennium.

5.4.3 Laena Island

A total of eight sites were recorded on Laena Island (Figure 5.30). These included surface scatters of pottery and chert, several shrine complexes and a shell-grinding station. A visit was made to the old village site of Laena, which was abandoned in the 1980s and whose occupants shifted to the Choiseul mainland. Many of its descendants now live at Rokoso although the island is still actively used for the production of copra, growing betel nut, and fishing by descendant families.

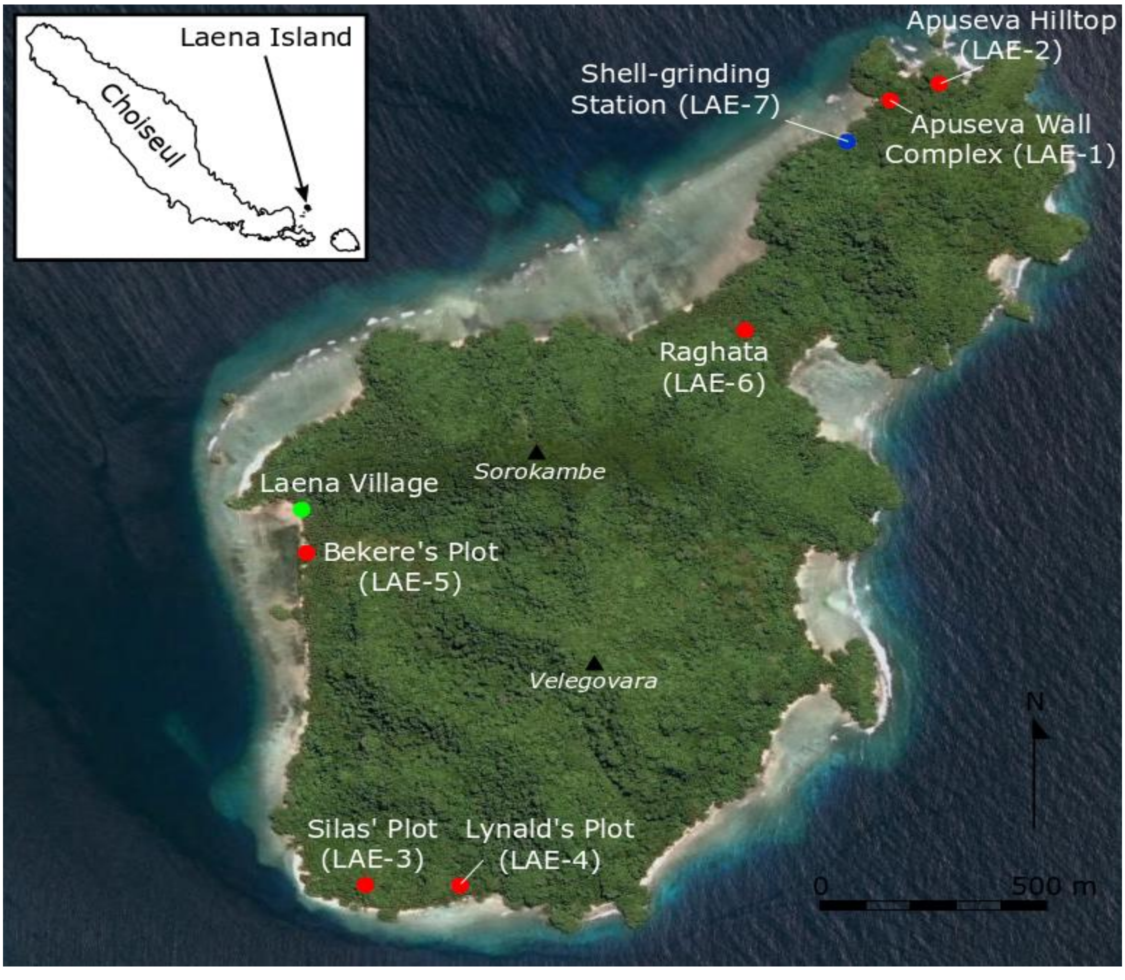


Figure 5.30 Map of Laena Island showing locations of archaeological sites. Red circles = ceramic scatters; blue = aceramic sites; green = modern village.

Laena Island measures approximately 2 sq. km. in size and is divided into plots owned by senior males of descendant families. Selection of sites and areas to survey was carried out primarily under the direction of Lynald Madada and Chief Denson, two Laena Island landowners, and other older community leaders from Rokoso community. As no systematic surveying had been carried out on the island, site coverage was prioritised. It quickly became apparent, however, that shrine complexes and ceramics were widespread on the island. Furthermore, as the pottery exhibited affinities with incised and impressed sherds from Wagina, the site was considered worth dating to provide a more robust temporal provenance for ceramics and shrines found on these islands.

Two sites were excavated and radiocarbon dated: a coral wall shrine complex located at the far northern end of the island called Apuseva (LAE-1) and an erected coral slab structure that formed part of a shrine complex (LAE-4) located in a plot owned by Lynald situated at the southern end of the island. These sites and results of their excavations and dating are described first to provide a temporal foundation to the historic settlement of the island. This is followed by brief summaries of a large pottery and chert scatter (LAE-6) and a shell-grinding station (LAE-7) recorded on the island.

LAE-1 Apuseva Wall Complex

The largest shrine and wall complex was identified at the far northern end of the island in an area called Apuseva (Figure 5.30). In oral history described to me by Rokoso villagers, the name 'Apuseva' refers to a traditionally sacred part of the northern cliff face of the island. They associated this part of the island with a 'Red Shark' that travelled between Laena Island and Nuatambu along a 'coral road', which the villagers agreed was a coral reef that extends northwest to Nuatambu. The shrine complex consisted of a coral stone altar located at its centre and an upper platform located behind it which skirted the bottom of the steep slope of Apuseva Hill (Figure 5.31). A grindstone was found on top of the altar, although it was not possible to determine if this was in its primary context or if it had been placed there more recently. Below the altar, two impressive stone walls were constructed. The largest of these, the outer wall, was built facing the western coast and measured about 1.5 m at its highest point.

A wide variety of surface artefacts were collected between the small terrace and inner stone wall. These included pottery, quartz fragments and chert flakes, topa and shellfish remains, ovenstone, two nut anvils, a Conus ring fragment and Tridacna hinge fragments. Several coral limestone slabs possessing deep grooves and holes ground into them were found scattered around the site and were deposited or built into the coral walls. These artefacts, we called 'drilling stones', are likely to have served as an important grinding tool and anvil in the drilling and grinding of shell. The holes may have also served as anvils for nut-cracking and the crushing of quartz to be used as abrasive powder to grind shell (discussed in Chapter 7). By the outer edge of the inner wall, we found pottery, worked shell, a chert flake, a human skull fragment and shellfish remains. Two small upright structures, most likely coral slabs chambers containing shell valuables and at least one human skull, are likely to have stood by the outside of the inner wall in the past although have since collapsed.

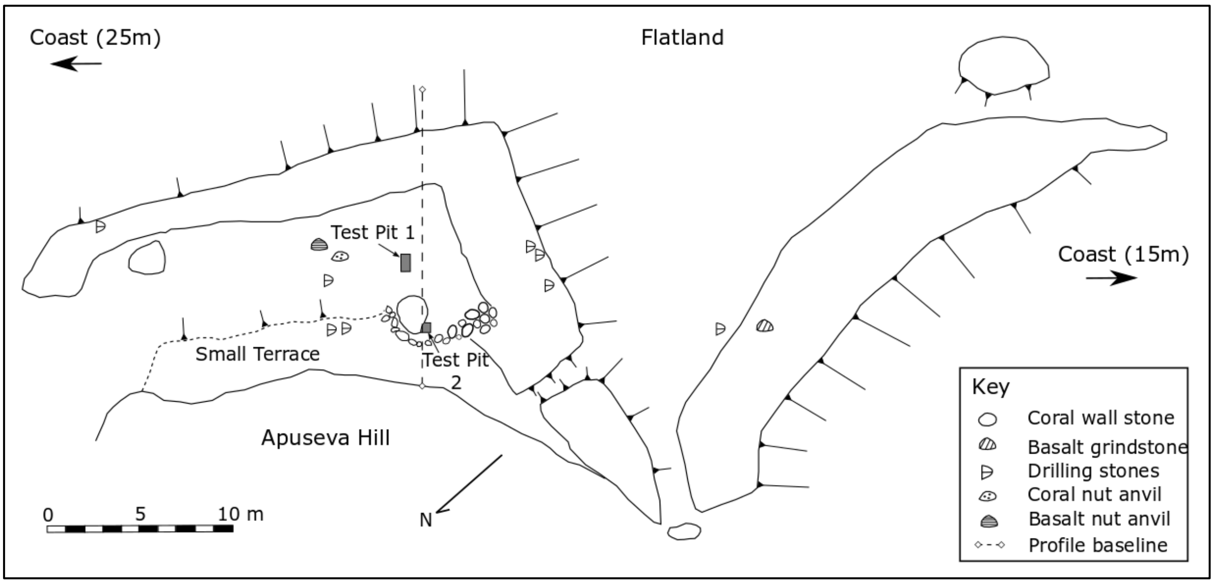


Figure 5.31 Plan of Apuseva Wall Complex (LAE-1) showing positions of Test Pits 1 and 2.

Following an initial walkover of the site, it was considered worth excavating due to no clear indication of considerable disturbance to the site such as storm surges. Additionally, the site contained a wide range of material culture that could provide further insight into the functional and ceremonial significance of the shrine complex.

Excavation and Chronology

Two test pits were dug over two days at Apuseva (Figure 5.31). Test Pit 1 was placed between the coral stone altar located at the centre of the complex and the inner stone wall. This area was targeted as it was particularly rich in surface artefacts. Test Pit 2 was positioned directly adjacent to the southwest corner of the coral stone altar to investigate buried evidence of offerings or other material culture that could provide further insight into activities that took place in this part of the shrine complex. The excavations were carried out by trowel and in 10 cm spits. Sieving was performed by hand as no sieves were available.

Test Pit 1 measured 1 x 0.5 m in size and was dug to a depth of approximately 70 cm. Test Pit 2 was made smaller due to a lack of diggable ground, measuring 0.5 x 0.5 m in size, and was excavated to a depth of 1 m. Two pot sherds and a small Conus shell ring fragment were found on the surface of Test Pit 1 and several quartz fragments, a shell ring fragment and two pot sherds were found on the surface of Test Pit 2. The test pits exhibited a similar stratigraphic profile, comprised of three cultural layers and a natural marine sand base layer, although Test Pit 2 proved to be deeper due to its slightly elevated position (Figure 5.32).

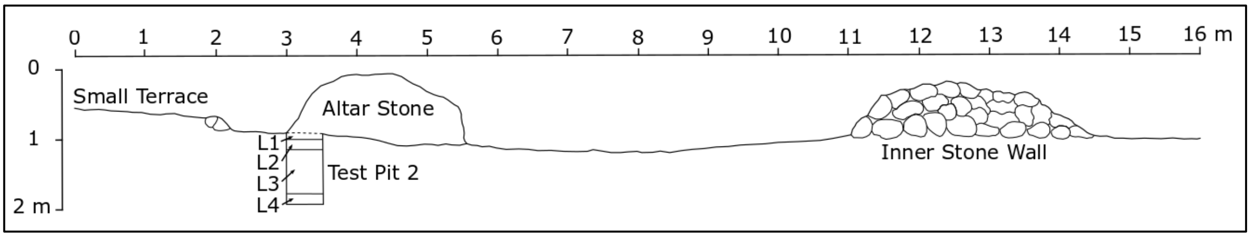


Figure 5.32 Profile of Apuseva Wall Complex (LAE-1).

For both test pits, Layer 1 (0-10 cm) was a dark brown to black friable topsoil layer that contained a proportionally high density of pottery, chert, quartz, bone and shell compared to Layers 2 and 3 (Tables 5.8 and 5.9). In Test Pit 2, a ground pig tooth and Conus ring fragment were found in this layer. Layer 2, which was a looser dark brown to black soil, was thicker in Test Pit 2 (10-35 cm) than in Test Pit 1 (10-20 cm). Similar finds were made in this layer for both test pits, although Test Pit 2 contained a higher abundance of quartz and shell, including worked Tridacna. Three fragments of red ochre, an effective colouring agent used widely in Melanesia for both ritual and utilitarian activities (Garling 2017: 217-218), were also found in this layer in Test Pit 2.

Layer 3 appeared as a light brown greenish clayey soil and was thicker in Test Pit 2 (35-88 cm) than in Test Pit 1 (20-56 cm). Both test pits demonstrated a general decrease in the density of finds in this layer. No charcoal or fire features were identified in the test pits although wood charcoal and nutshell were found throughout Layers 1 to 3. Layer 4, a white loose beach sand, contained a few intact pieces of shell and coral. Charcoal fragments and two pot sherds were found at the top of this layer in Test Pit 2 and were interpreted to have most likely been intrusions from Layer 3. Deeper excavation to reach the water table or bedrock was not possible due to time limitations, although the sterility of Layer 4 indicated that it was likely the bottom of the cultural deposit had been reached.

Table 5.8 Stratigraphic distribution of finds in Test Pit 1 at Apuseva (LAE-1) according to frequency and weight. Weight in g.

Material Class	**Layer 1**		**Layer 2**		**Layer 3**		**Layer 4**		**Count**	
	No	*Weight*	*No*	*Weight*	*No*	*Weight*	*No*	*Weight*	*No*	*Weight*
Pottery	16	37.1	3	6.2	2	4.1	-	-	21	47.4
Chert	8	11.8	1	0.4	2	1.1	-	-	11	13.3
Quartz	3	9.9	1	1.9	1	5.3	-	-	5	17.1
Pumice	-	-	-	-	4	5.5	8	3.3	12	8.8
Bone	1	4.3	4	8.2	3	5.2	-	-	8	17.7
Shell	5	10.5	-	-	12	19.4	-	-	17	29.9
Total	33	73.6	9	16.7	24	40.6	8	3	74	134.2

Table 5.9 Stratigraphic distribution of finds in Test Pit 2 at Apuseva (LAE-1) according to frequency and weight. Weight in g.

Material Class	**Layer 1**		**Layer 2**		**Layer 3**		**Layer 4**		**Count**	
	No	*Weight*	*No*	*Weight*	*No*	*Weight*	*No*	*Weight*	*No*	*Weight*
Pottery	8	13.5	7	15	5	7	2	5.2	22	41
Chert	2	11.1	2	2.7	1	6	-	-	5	19.8
Quartz	50	152.7	47	48.5	7	5.9	-	-	104	207.1
Pumice	-	-	1	0.3	4	1.2	-	-	5	1.5
Bone	4	9.3	9	11.4	7	8.5	-	-	20	29.2
Shell	4	7.8	12	94.0	11	17.4	3	3.2	30	122.4
Total	68	194.4	78	172	35	46	5	8	186	420.7

Three charcoal samples were submitted from the excavations for AMS dating (Table 5.10). These included a thick nutshell fragment from Layer 3 in Test Pit 1 which resembled a Canarium or Barringtonia nut, and one nutshell fragment and possible twig from the upper and lower parts of Layer 3 in Test Pit 2. The third sample produced a modern age and it is likely the 'twig' was in fact a darkened root fragment. The lack of overlap between the other two dates which were sampled from similar depths in Test Pits 1 and 2 is likely the result of root disturbance displacing the nut fragment from Test Pit 1 (OZX446) from its original position higher in the stratigraphy. Both dates demonstrated, however, that the shrine complex, at least certainly its inner part, is likely to have been constructed within the last three centuries.

Table 5.10 Radiocarbon dates produced from excavations of Apuseva (LAE-1), Laena Island. Calibrated age range and median determined using Oxcal 4.3.

Lab Code	Material	Unit	Layer	Depth (cm)	Uncal. C14 Age	CalBP Range (2 sigma)	CalBP Median
OZX449	Wood	TP2	3	85-90	Modern	-	-
OZX445	Nut/seed	TP2	3	40-50	260 ± 25	429 (20.6%) 375 324 (63.4%) 281 170 (11.4%) 151	302
OZX446	Nut	TP1	3	40-50	180 ± 30	298 (19.1%) 254 225 (51.9%) 136 115 (4.1%) 73 34 (20.4%) …	179

Overall, the preliminary dating of Apuseva demonstrated that this part of Laena Island was occupied no earlier than 430 calBP. Furthermore, combining the dating results with the material culture evidence gathered from the test pits, it is likely that the most intensive period of human activity at the site took place between approximately 300 to 180 calBP and was centred predominantly on the production of shell valuables. This was supported mainly by presence of complete and unfinished shell rings, grindstones and quartz used traditionally as an abrasive powder, known in Avaso as *sauru*, in the grinding of shell (Piko 1976: 109).

LAE-4 Lynald's Plot

Another large shrine complex was recorded at the southern end of Laena Island within a plot owned by Lynald (Figure 5.30). It comprised two structures constructed of large coral slabs erected into rectangular formations, two elliptical shaped earthen mounds, and several low coral and basalt mounds heaped in linear and circular formations. A wide range of artefacts were found on the surface of the site including pottery, shell rings and ornaments, fishing net weights, grinding stones, and basalt anvils and hammerstones used for nut processing. One of the earthen mounds contained a distal portion of a human humerus which suggested the mounds may have been constructed partly as burials as well as shrines dedicated to the harvesting of shellfish or shell ornament manufacture. Precaution was taken, however, when assessing the ceremonial function of these structures based on the surface finds as I was informed the area had been used for gardening and copra production in the last few generations and thus was likely disturbed.

The two erected coral slab structures, named Rectangular Slab Formation (RSF) 1 and 2, were independently mapped (Figures 5.33 & 5.34).

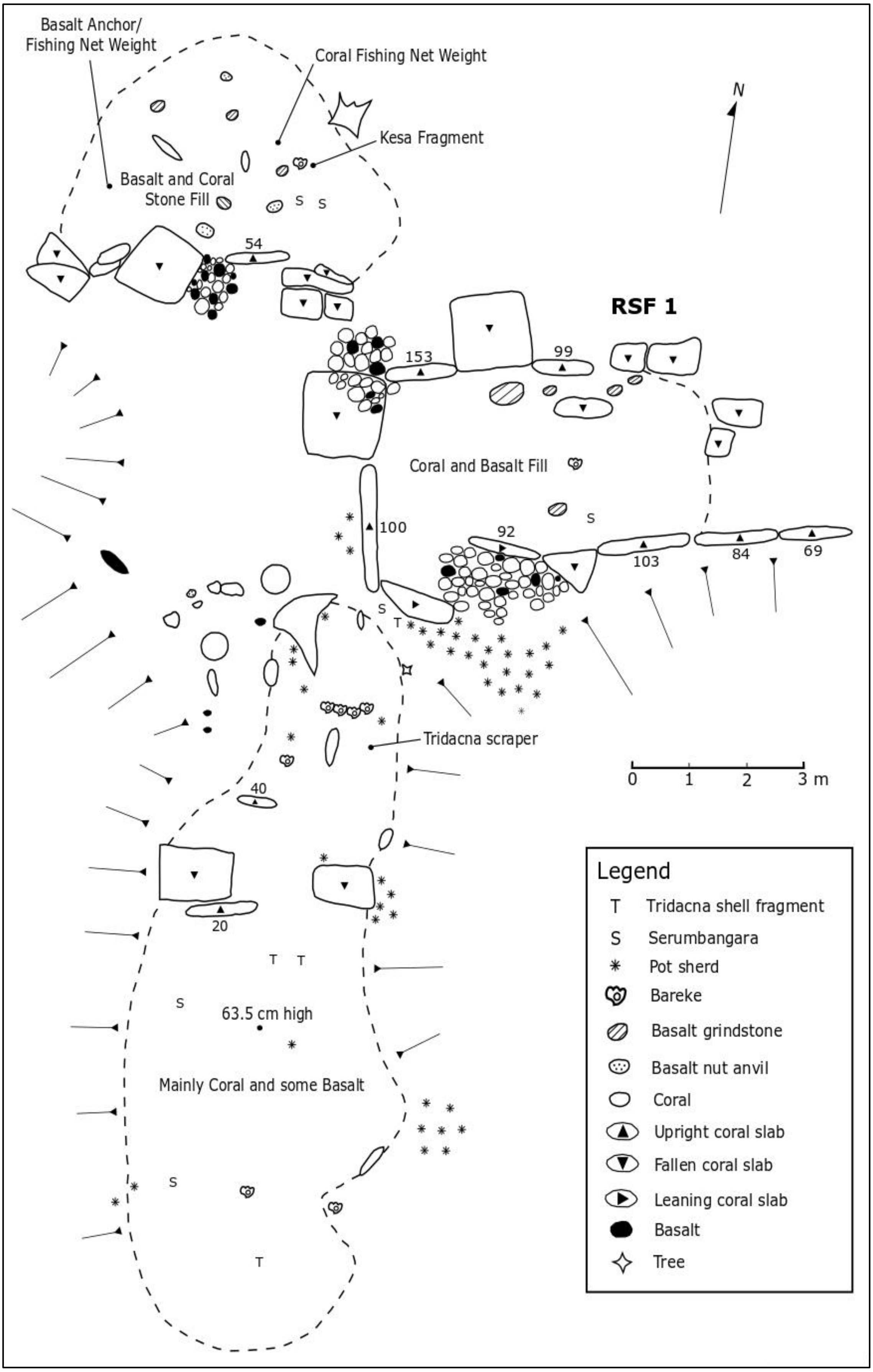


Figure 5.33 Plan of RSF 1 and nearby linear and circular coral and basalt mound shrines.

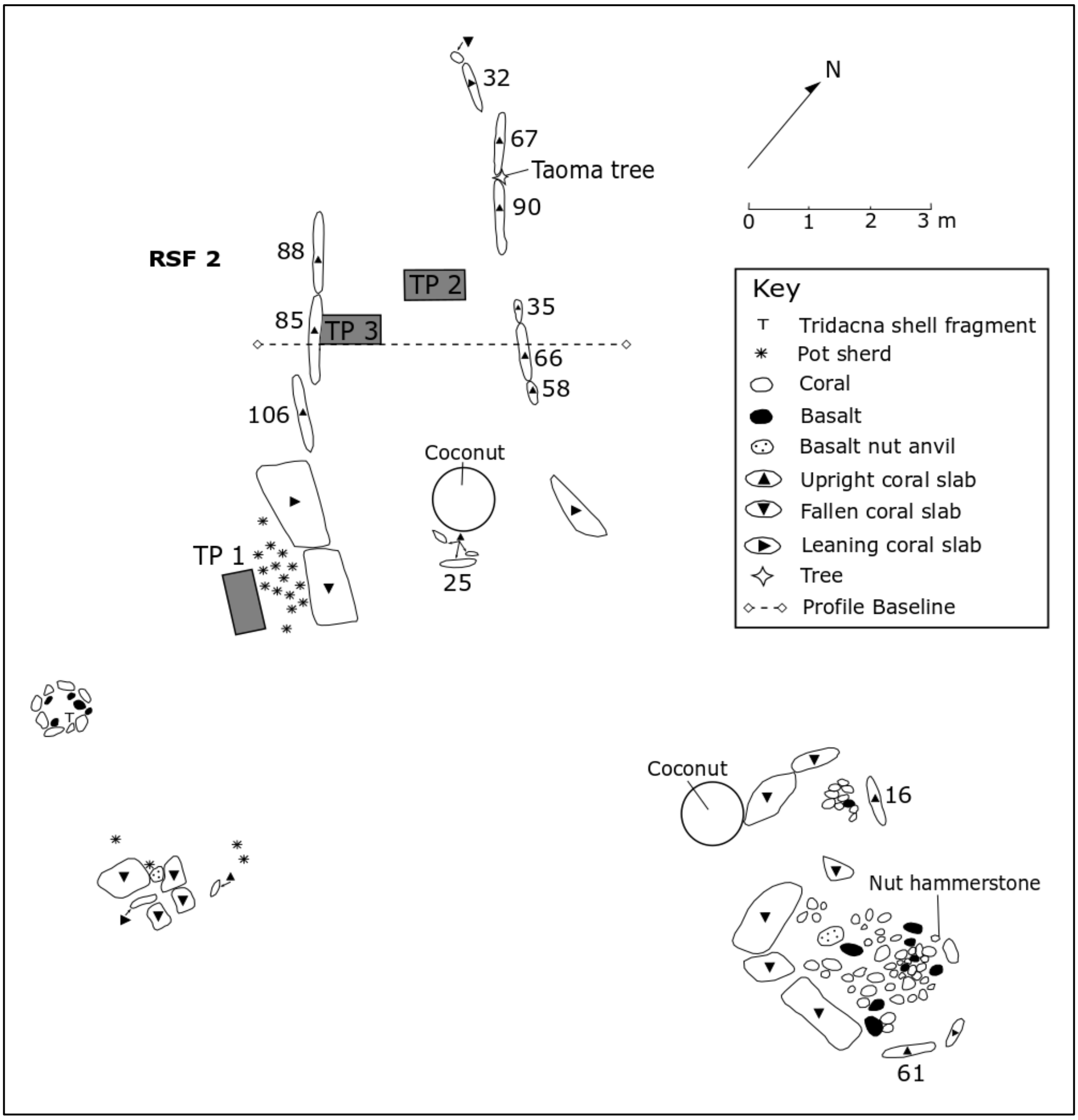


Figure 5.34 Plan of RSF 2 showing location of test pits and nearby coral mounds and stone circle formations. Numbers adjacent to upright coral slabs indicate height in cm.

RSF 2 was the larger of the two coral slab structures and measured approximately 9 m long and 4 m wide. These coral slab structures were particularly impressive as the substantial size and weight of the slabs demonstrated a considerable communal and organised effort was required in their construction[8]. To gain further insight into the nature and timing of the construction of the shrine complex, the site was excavated. Of all the shrine structures, RSF 2 was deemed the most appropriate to excavate because its surface was free of coral and basalt rubble. Consideration was also taken to minimise any damage or disturbance our excavations would have on the site.

[8] One of the slabs in RSF 2 that was excavated measured 187 cm in length, 140 cm in width and about 18 cm thick, and we estimated it to weigh in excess of 200 kg.

Excavation and Chronology

Three test pits were dug over two days at RSF 2 (LAE-4) (Figure 5.34). Test Pit 1 was placed within a small pottery scatter located near the southwest corner of the structure, and was targeted at gathering a stratified sample of pottery. Test Pit 2 was placed in the centre of the structure to assess the presence of human burials or buried goods. Test Pit 3 was positioned directly adjacent to an upright coral slab to investigate the construction of the structure. Excavations were carried out in 10 cm spits using trowels and spades, and sieving was done by hand as no sieves were available.

All three test pits were similarly sized, measuring 1 x 0.5 m, and were dug to depths no deeper than 1.5 m where it became difficult to continue digging without opening the excavations more substantially. This was not considered appropriate due to time limitations and the preliminary scope of assessing the stratigraphic profile of the site. The test pits exhibited three upper cultural layers that were visually near-identical although differed minorly in their consistency, and an underlying friable to compact light brown soil that contained natural sedimentary stone (Table 5.11).

Table 5.11 Layer descriptions for Test Pits 1-3 dug at RSF 2 (LAE-4).

Test Pit 1	**Test Pit 2**	**Test Pit 3**
Layer 1 (0-9 cm) - Friable, dark brown to black topsoil	Layer 1 (0-8 cm) - Friable, dark brown to black topsoil	Layer 1 (0-10 cm) - Friable, dark brown to black topsoil
Layer 2 (9-60 cm) - Slightly more compact dark brown soil	Layer 2 (8-60 cm) - Slightly more gravel-like and compact dark brown soil	Layer 3 (10-75 cm) - Loose to friable dark brown sandy soil layer similar to Layer 3 of Test Pit 2
Layer 3 (60-150 cm) - Upper part (60-115 cm): friable to compact dark brown soil - Lower half (115-150 cm): dark brown to black sandy soil	Layer 3 (60-130 cm) - Dark brown sandy soil less compact than Layer 2	Layer 2 (75-130 cm) - Compact dark brown soil similar to Layer 2 of Test Pit 2 containing fresh coral and sedimentary stone fill
N/A	Layer 4 (130-150 cm) - Light brown friable to compact soil containing natural sedimentary rocks	Layer 4 (130-150 cm) - Light brown friable to compact soil containing natural sedimentary rocks

Fresh coral and sedimentary stone were found dumped at the base of the erected coral slab where Test Pit 3 was dug and its profile demonstrated an inverted Layer 2 and 3 (Figure 5.35). This was interpreted to have been created during the filling of the hole originally dug to insert the coral slab. Although no cuts were identified in the excavating of the test pits to determine the true extent of the original earth removal.

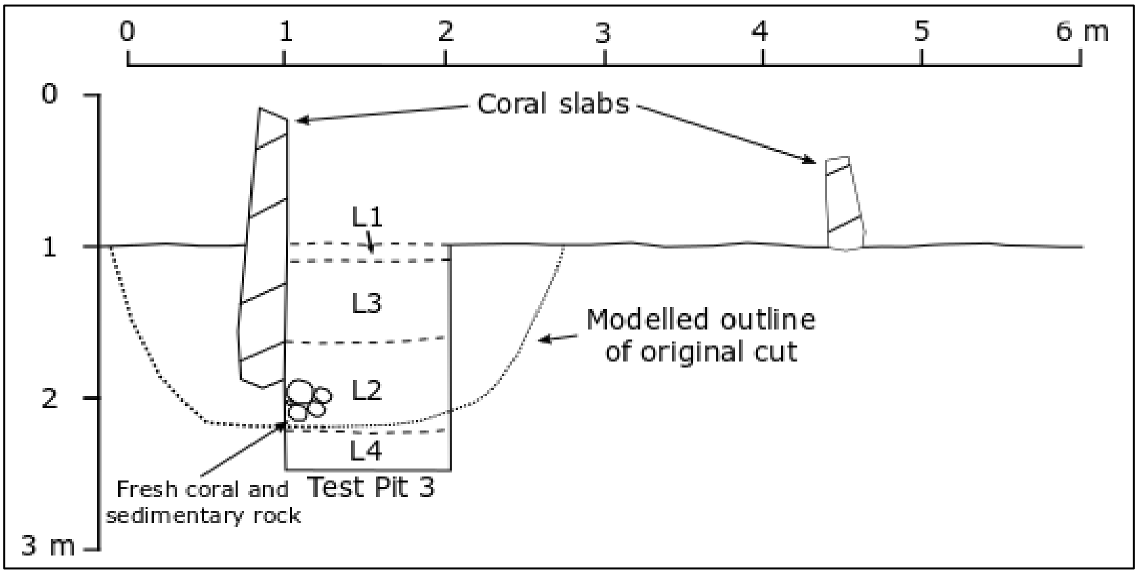


Figure 5.35 Profile of RSF 2 (LAE-4) showing stratigraphy of Test Pit 3 and modelled outline of original hole dug to prior the erection of the coral slab.

Few finds were made in Test Pits 2 and 3. This included charcoal fragments and four pot sherds found in Layer 3 of Test Pit 2 and five sherds found in Layer 2 of Test Pit 3. Fortunately, one of the sherds excavated in Test Pit 3, a notched outcurving rim sherd, was found beneath some of the fresh coral and rock dump and contained dateable soot on its surface. Test Pit 1 exhibited a wider range of finds including pottery, ovenstone, two chert flakes and shellfish (Table 5.12). These were found in their highest density within the top 50 cm of the test pit, and although the natural was not reached the lack of artefacts found in the lower part of Layer 3 (115-150 cm) demonstrated it was nearing Layer 4.

Table 5.12 Stratigraphic distribution of finds in Test Pit 1 at RSF 2 according to frequency and weight. Weight in g.

Material Class	**Layer 1**		**Layer 2**		**Layer 3**		**Count**	
	No	*Weight*	*No*	*Weight*	*No*	*Weight*	*No*	*Weight*
Pottery	7	26.5	45	154.9	4	10.6	56	192.0
Chert	-	-	2	1.5	-	-	2	1.5
Ovenstone	-	-	3	27.2	1	32.1	4	59.3
Shell	1	5.0	1	4.3	3	6.7	5	16.0
Total	8	31.5	51	187.9	8	49.4	67	268.8

Three charcoal samples recovered in the excavations were submitted for AMS dating (Table 5.13). These included a nutshell or seed fragment collected from near the base of Layer 3 in Test Pit 2, soot scraped off the rim sherd found below the fresh coral and rock foundation in Test Pit 3, and a nutshell fragment found at the same level as ovenstone in Layer 2 in Test Pit 1. The soot was wood charcoal identified to belong most likely to the Myrtaceae family. The close overlap between the calibrated age ranges of OZX450 and OZX443 suggest the construction of RSF 2 was likely to have taken place between 650-550 calBP. The younger calibrated age of OZX444 suggests the nutshell may have been deposited near the time of structure's construction or is evidence of visitations made to the structure over succeeding generations.

Table 5.13 Radiocarbon dates produced from excavations of RSF 2 (LAE-4), Laena Island. Calibrated age range and median determined using Oxcal 4.3.

Lab Code	Material	Unit	Layer	Depth (cm)	Uncal. C14 Age	CalBP Range (2 sigma)	CalBP Median
OZX450	Nut/seed	TP2	3	110-120	620 ± 30	659 (95.4%) 550	600
OZX443	Soot	TP3	3	80-90	660 ± 25	671 (47.5%) 632 599 (47.9%) 560	607
OZX444	Nut	TP1	2	40-50	415 ± 25	518 (88.5%) 451 445 (1.0%) 439 350 (5.9%) 334	490

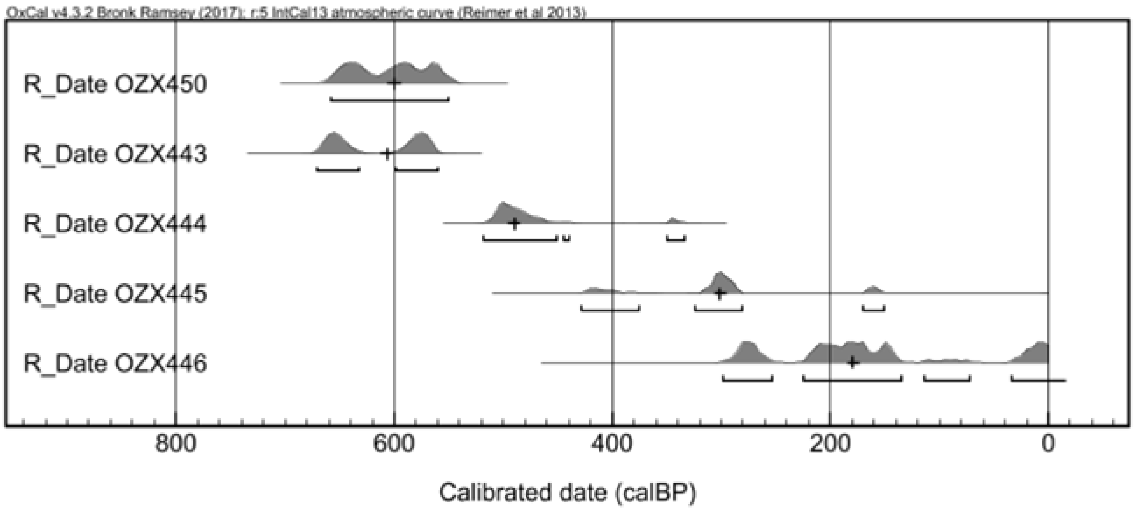


Figure 5.36 Plotted radiocarbon (C14) sequence of late prehistoric to historic occupation of Laena Island. 2 sigma (95.4%) ranges and '+' indicates median.

Overall, the preliminary excavations and dating of RSF 2 demonstrated that the construction of the wider shrine complex in Lynald's Plot (LAE-4) began in approximately 600 calBP. Furthermore, there is evidence that RSF 2 was revisited over the following century and offerings were made at the structure. Combining the radiocarbon sequence of RSF 2 with that of Apuseva (LAE-1) (Figure 5.36), it can be summarised that communally-organised, monumental shrine construction and worship developed on Laena Island at least as early as 600 calBP and continued up until 150 calBP.

LAE-7 Shell-grinding Station

Approximately 150 m southwest of Apuseva on the northwest coast of Laena Island, a shell-grinding station site was identified (Figure 5.30). Twelve grindstones were counted at the site, some of which were concave and others possessing striations or grooves that individually measured about 1-3 cm in depth and width (Figure 5.37).

Figure 5.37 Shell-grinding station located in northwest Laena Island. Largest grindstone featured near the top of the photo. Note large Tridacna hinge located to its right.

The largest grindstone measured 1.2 m in length and 0.9 m in height. Large *T. gigas* hinge fragments were also found on the shore. No grindstones were visible on the high ground above the high tide mark, and they did not appear to have been disturbed extensively from their original location. Importantly, the number of grindstones at the site and the considerable effort invested into preparing grooves on them reinforced the importance placed on the production of shell valuables by the inhabitants of Laena Island.

LAE-6 Raghata

One of the largest surface scatters of pottery was found on an approximately 250 m stretch of flatland that conjoins the head of Laena Island, Apuseva, to its body comprised of two large twin peaks, Sorokambe and Velegovara (Figure 5.30). The area is known as Raghata and was used as a designated garden by Laena villagers prior to the 1980s. During a walkover survey of the flatland, three coral mound shrines were recorded and a total of 314 pot sherds and a large, high-quality red chert nodule were collected. No pottery was found on the coastlines but only within the open cover forest. The artefacts appeared in random clusters distributed discontinuously along the entire stretch of the flatland, which was considered likely to have been influenced by gardening activities of the twentieth-century.

Comparing the site to other parts of Laena Island that were surveyed, the high density of pottery encountered there and the absence of shrines dominating the landscape suggested that it may have been a suitable site for a garden or village in the past. This was significant as no historic village or earlier domestic spaces were identified on the island. Raghata may have been such a site, although further surveying would be required to gain further insight into village settlement on the island associated with the proliferation of shrine construction and shell-working that occurred there during late prehistory.

5.4.4 Nuatambu

No new sites were recorded on Nuatambu and the fieldwork carried out on the islet was centred upon re-locating Miller's 1978 test pit and re-excavating the site to provide a more resolute chronology of its prehistoric occupation. Nuatambu is an islet of volcanic origin, measuring approximately 0.14 sq. km and reaching 103 m asl, and is connected to another small offshore island by a 200 m long intertidal sand bar (Figure 5.38).

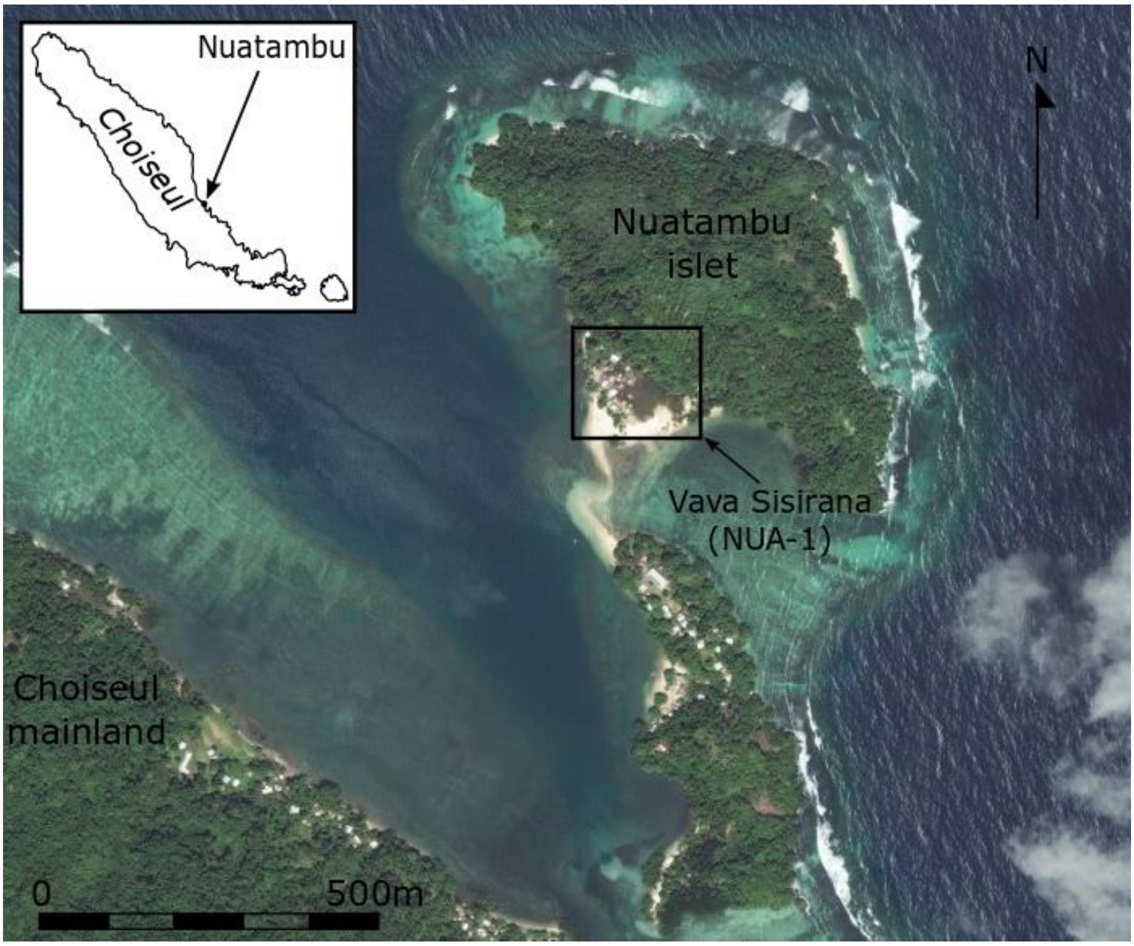


Figure 5.38 Satellite image of Nuatambu showing location of the archaeological site (NUA-1).

Its name, which translates to 'sacred island' in the local language of Kirungella, is associated with a still highly revered oral tradition of the island being the birthplace of kesa. For example, one villager described Nuatambu to me as the 'bank of Choiseul'. The islet is also significant for the fact that it has been significantly impacted by sea level rise and coastal recession. Specifically, previous climate research carried out on Nuatambu has demonstrated the islet has reduced in size by approximately 50% since 1947 (Albert *et al*. 2016: Table 1). This provided further incentive to re-excavate Nuatambu while buried deposits had not yet been destroyed.

NUA-1 Vava Sisirana

During his survey of Nuatambu village, Miller recorded the highest concentrations of worked shell and pottery on the islet and named the site Vava Sisirana. At the time of the present study, there was still a high degree of pottery observed on the surface as well as several nut anvils and chert flakes. Tridacna debitage created from shell-working was also plentiful at the site, although in the forty years since Miller's survey, large pot sherds, shell ring fragments and other ornaments had been collected by villagers. The remainder of this section will describe results of the excavation. Unfortunately, due to a disagreement between local landowners, the excavation was stopped abruptly and all finds, including dateable charcoal, collected during the excavation were not able to be included in this study. Therefore, throughout the description of the site, Miller's (1979) field data will be constantly referred to as a comparative soundboard.

Excavation and Chronology

Two test pits were excavated over five days at Vava Sisirana (NUA-1). Their placement was decided following a walkover survey of the beach flat and the entire coastline of the islet, and once the location of Miller's excavation had been identified. This was carried out using Miller's (1979) sketch map of Vava Sisirana from which it was established that his original test pit had been dug approximately five metres northwest of a two-storey house built in more recent years by a villager, Ken Wright (Figure 5.39). A small mound located at that spot was determined to have been a remnant of Miller's spoil heap.

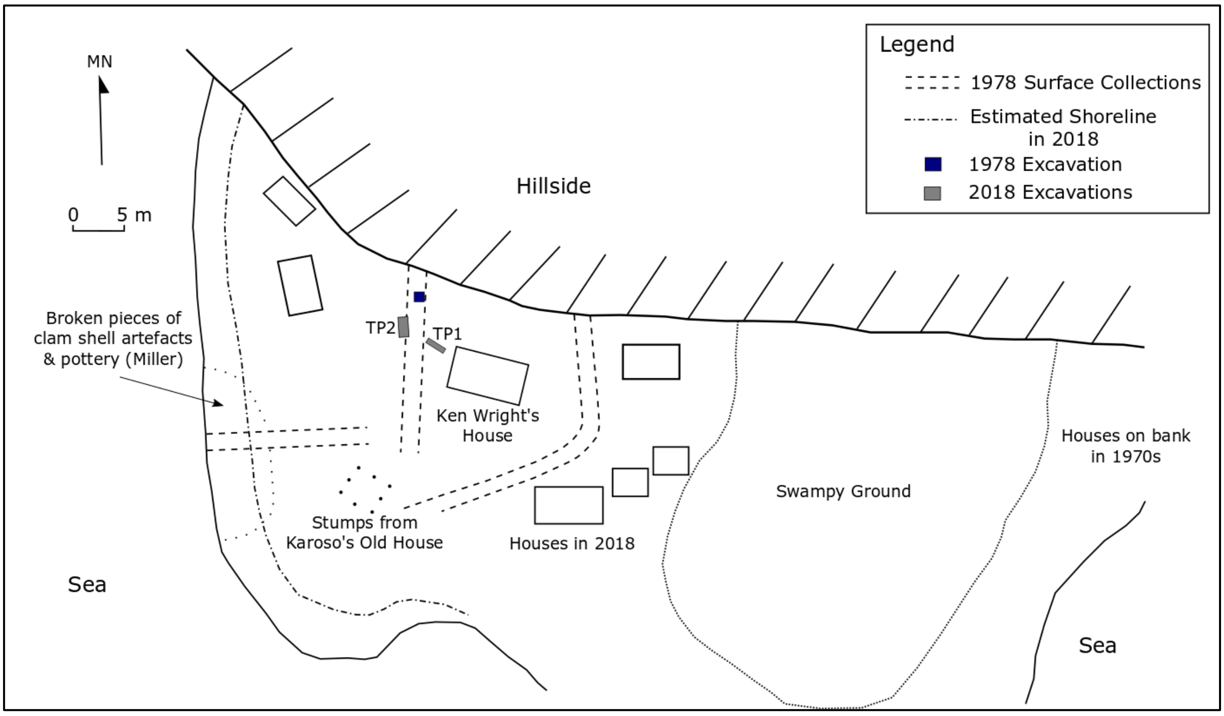


Figure 5.39 Plan of Vava Sisirana (NUA-1) showing locations of 1978 and 2018 excavations (adapted from Miller 1979: Fig. 4.1).

Test Pit 1, which measured 2 x 0.5 m, was only dug to a depth of 25 cm as we realised we were encroaching too closely to Wright's house. Another test pit, Test Pit 2, was opened several metres further west. This test pit was systematically excavated by trowel and using dry and wet sieving. It was oriented in a north to south direction and comprised two 1 m^2 grid square units (A-B). The bottom of the cultural deposit was not reached due to a disruption to our fieldwork, and the deepest the pit was excavated was 80 cm. Six cultural layers and several features including clay floor surfaces and small ovens were identified from the test pit (Figure 5.40). Descriptions of these contexts will be given with reference made to Miller's section and field notes (Miller 1979: 67-72).

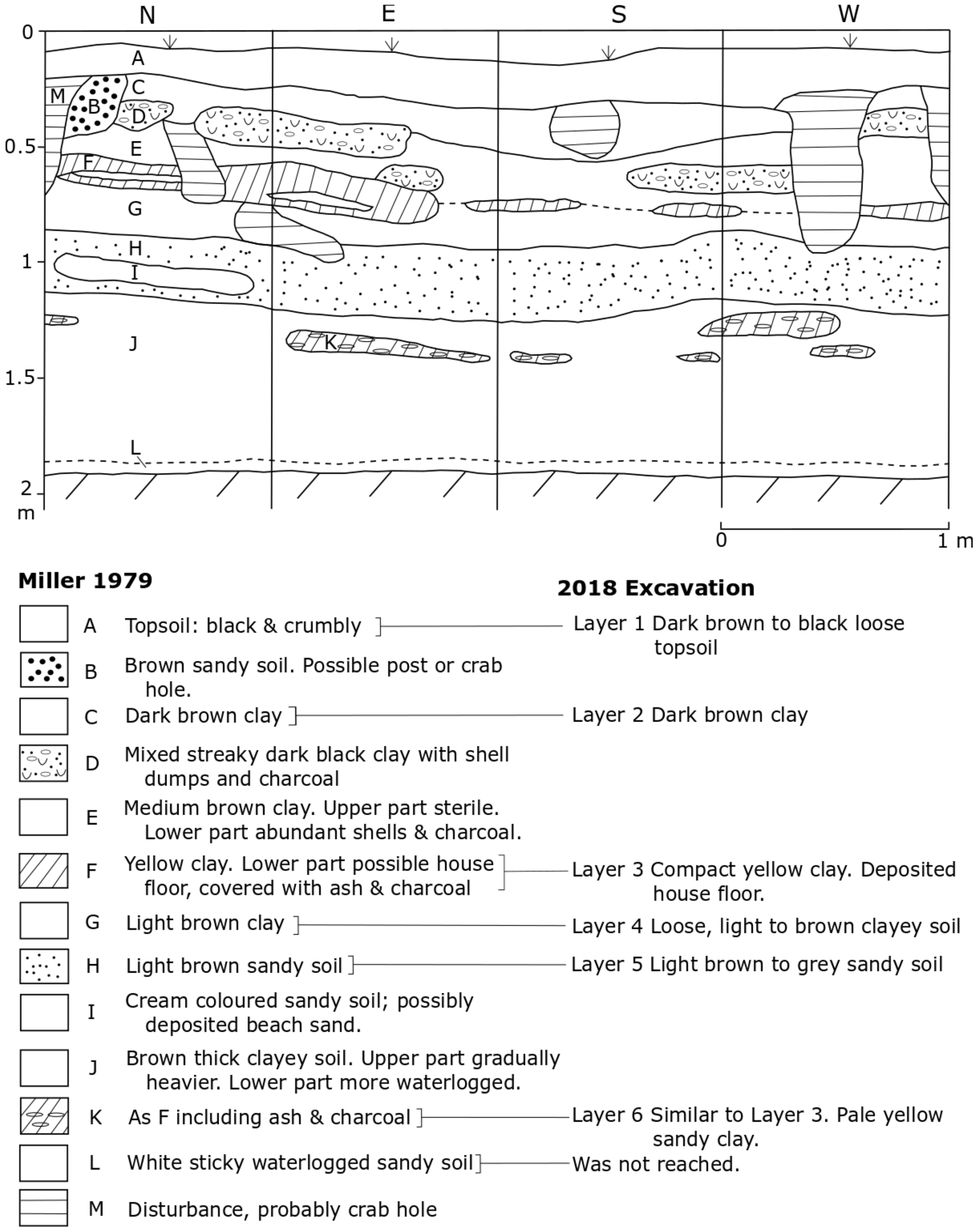


Figure 5.40 Miller's original section with comparisons to layers identified in 2018 excavation (adapted from Miller 1979: Fig. 4.2).

Layer 1 (0-13 cm) was a dark brown to black loose topsoil layer containing pottery, charcoal, nutshell, chert flakes and ovenstone. Layer 2 (13-30 cm), which resembled Miller's Layer C, appeared as a mixed clayey soil layer dark brown to grey in colour. Remnants of an ovenstone firepit were identified in square A at the bottom of the layer, and other finds included pottery, charcoal, shellfish and chert flakes.

Layer 3 (30-40 cm), a compact yellow layer of clay intermixed with red streaks, charcoal and small shell dumps, marked a distinct change in the stratigraphy. It was determined to be the same as Miller's house floor layer, Layer F, and it is likely to have been deposited. This was supported by the layer having an artificially straight outline and the presence of several charcoal lenses in section above the layer (Figure 5.41). In grid square A, fragments of a shattered pot were found clustered together just below the layer. Other notable finds recovered on top of or within Layer 3 included a bone implement used to decorate pottery, a shell money bead, a pig mandible, two possible Tridacna dorsal region adze preforms and large chert flakes.

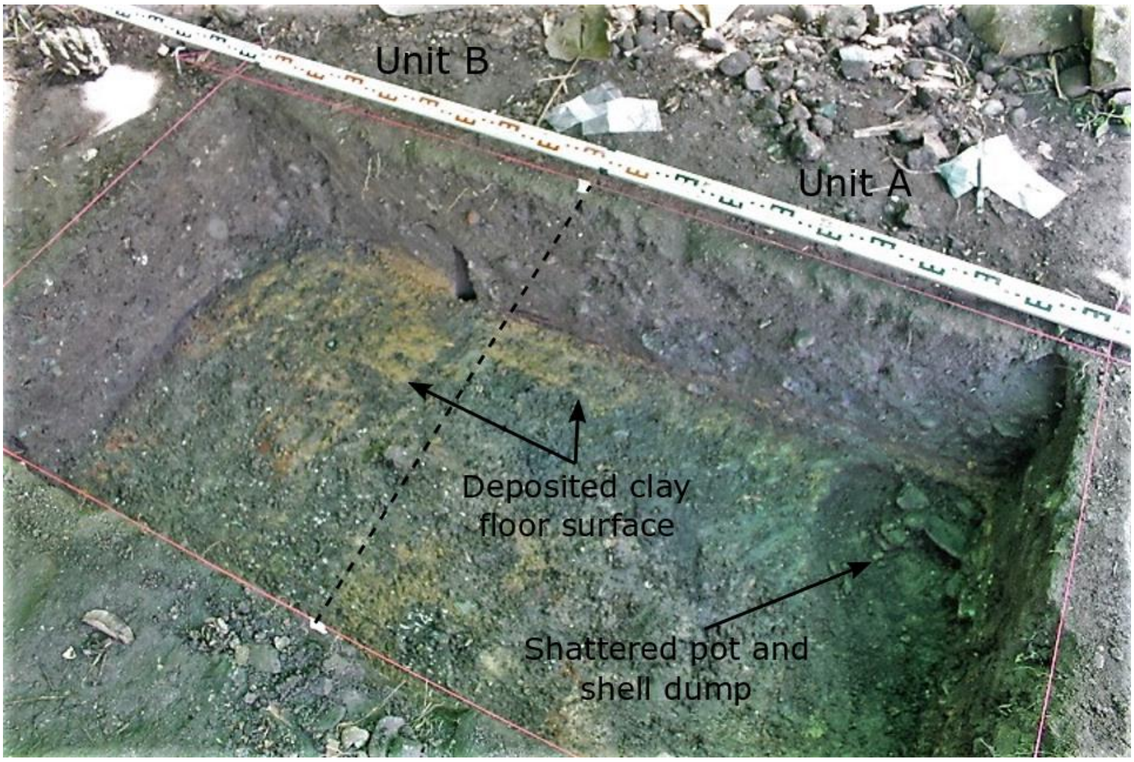


Figure 5.41 Photograph of Test Pit 2 taken at 40 cm deep showing deposited yellow clay floor surface (Layer 3) and a shattered pot and shell dump.

Layer 4 (40-50 cm) was a looser, light to dark brown clayey soil that resembled the bottom of Layer 1. In similar fashion to Miller's Layer G, this layer possessed a high concentration of pottery and fish bone. A concentration of greyish white ash and red clay, which was identified to be remnants of the base of a firepit, was found in the southwest corner of the test pit. Adjacent to this were several large oven stones and a stone file. Layer 5 (50-80 cm) was a light brown to grey sandy soil layer that contained lesser amounts of pottery and shell than the upper layers. Layer 6 (>80 cm) was only partly uncovered although it closely resembled Layer 3, appearing pale yellow in colour and consisting of sandy clay. It was determined the layer was a yellow clay floor surface that matched Miller's Layer K. A few pot sherds were found lying flat on top of the layer and at the same depth of about 80 cm. Other notable finds made in Layers 5 and 6 included a small shell money bead, stone file fragment, flat stone tool probably used as a chopper, and a bone implement with carved designs that appeared as a hair pin, but which may have also been used to decorate pottery.

Overall, the stratigraphic profile of Test Pit 2 demonstrated evidence of at least two successive phases of prehistoric settlement of this part of the intertidal beach front of Nuatambu. This was indicated by the floor features, Layers 6 (K) and 3 (F), identified at depths of 80 cm and 30-40 cm, respectively. Comparing the material culture recovered in these contexts, there were close parallels observed between the incised and impressed decorations of the Nuatambu pottery with the late prehistoric to historic assemblages from the Arnavon Islands, Laena Island and Wagina which would suggest Nuatambu dates to within the last millennium. Although the presence of a stylistically late Lapita sherd found on the surface of Nuatambu (Richards 2011) suggests there may have been an earlier phase of intertidal occupation at the site which has been lost from coastal erosion or has not yet been identified.

5.5 Survey and Excavation Summary of Manning Strait Sites and Conclusions

The new field data presented here contributes considerably towards expanding upon previous field research that has been carried out in the Western Solomons as well as building a more comprehensive archaeological sequence for the region. Results from the excavations and radiocarbon dating are particularly valuable as previously, due to a lack of surveying in large parts of the region as well as the highly unstable nature of intertidal zones, few stratified and dated ceramic deposits have been documented. Significantly, the dating of sites on Laena Island and Wagina are the first documented radiocarbon dates that have been produced for Choiseul. The remainder of this section will discuss key findings from the fieldwork that have implications to building upon our understanding about the prehistoric settlement and development of networks of interaction in the Western Solomons.

On Wagina, the 2.5 m-deep excavation and radiocarbon age of 2300-2150 calBP of Fly Cave makes it one of the deepest and earliest dated stratified deposits currently known for the Western Solomons. Compared to the few aceramic sites that have been documented in the main Solomons chain, specifically Vatuluma Posovi (ca. 4000-6000 BP) on Guadalcanal (Roe 1993) and Mwanihuki (ca. 3000 calBP) on Makira (Blake *et al.* 2015), Fly Cave is considerably younger and is likely to depict an inland hunting site as opposed to a pre-Lapita aceramic site. Its age is more comparable to Apunirereha (ca. 2100 calBP), a chert flaking floor and inland open site located in southern Malaita (Moser 2018). Importantly, the discovery and dating of Fly Cave demonstrated that Wagina holds potential for yielding earlier mid-Holocene or perhaps Late Pleistocene deposits.

In northwest Isabel, the discovery of a surface scatter of incised and fingernail impressed pottery on Papatura has expanded the known distribution of intertidal ceramic sites approximately 100 km further east along the mainland's northern coast. The pottery, which is described in more detail in Chapter 6, shared close stylistic similarities with late Lapita ceramics that have been recorded from Kusira and the New Georgia group (Felgate 2003). If the site dates to this period (ca. 2600-2000 calBP), it provides further evidence to support arguments previously made by Carter (*et al.* 2012) that northwest Isabel can be included in the prehistoric occupation of Western Solomons modelled by Walter and Sheppard (2017). Modelling of the prehistoric settlement of the Western Solomons is discussed further in Chapter 10.

The survey of the chert quarry site at Mendana Bay, located on the northern coast of central Isabel, was significant as it is the only recorded site of its kind in the Western Solomons. Chert was a particularly valuable and widely distributed resource in prehistory in the Western Solomons and throughout much of the country (e.g. Ward and Smith 1974; Sheppard 1992; Walter and Green 2011). In Manning Strait, Isabel chert was particularly important as it would have served as one of the nearest and richest sources for communities living in the region. Outcrops of chert have not previously been recorded in geological surveys of Choiseul, although, there are patches of sedimentary bedrock found throughout the province which may be chert-bearing. The ubiquity of chert artefacts, namely flakes, across much of the archaeological landscape of Manning Strait suggests that the material was relatively easy to access. An abundance of transportable nodules that can be found at outcrops along the northern coast of Isabel and the intensive scale of flake and core production evident at the Mendana Bay quarry site (MEN-1), highlight the strong possibility that chert was being regularly traded across Manning Strait. Closer technological examination of the flaked chert artefacts and further discussion on the notion of their distribution in this part of the Western Solomons is given in Chapter 8.

The radiocarbon dating of excavations carried out on the Arnavon Islands and on Laena Island provide a higher resolution to assessing cultural developments that took place between 900-300 calBP. This was a particularly significant period in the late prehistory of the Western Solomons that saw the development of head-hunting, shrine construction and intensified production and exchange of shell valuables. Furthermore, the arrival of Europeans in the sixteenth century and their eventual settlement in the region in the mid-nineteenth century were particularly influential in shaping these cultural movements leading into the historic period. The surveys carried out on the Arnavons, Laena Island, and Wagina demonstrated a rich and distinctive cultural repertoire that is strongly characteristic of the late prehistoric and historic sequences of the Western Solomons (c.f. Walter and Sheppard 2017: 131-162).

Archaeologically, this was exhibited most visibly by the large number of shrines encountered and the high frequency of shell valuables and human remains recorded at these sites. In southeast Choiseul, specifically on Laena Island and Wagina, a slight deviation from what has commonly been found in the New Georgia group was a higher incidence of pottery - both plainware and incised and impressed decorated ware - being present at shrine sites. This is likely to be associated with a longer history of pottery-making practised on Choiseul than anywhere else in the Western Solomons. In addition, the tradition of clay pots being used in interment practices in northwest Choiseul (Craven 2019) may have influenced ceremonial activities associated with shrines in southeast Choiseul. In the following chapter, closer attention is given to the decoration and vessel forms of the pottery recovered during fieldwork in Manning Strait to provide further insight into production and distribution patterns of the material class during prehistory.

Chapter 6 Ceramics I: Stylistic Evidence

This chapter explains the methodological procedure and provides a summary of findings from a stylistic analysis carried out on pottery collected in Manning Strait. It is structured in six sections. The first section gives an overview of the entire assemblage and the second explains the methodological approach, including the classification process, selection of attribute criteria and quantification of the ceramic data. The third, fourth and fifth sections present results of the stylistic analyses for pottery from Isabel, Arnavon Islands and Choiseul, respectively. Each section is similarly structured, beginning with a short introduction detailing the provenance and condition of each assemblage from that region followed by more detailed descriptions of decoration and vessel forms. The final section is a brief discussion about patterns of prehistoric ceramic production and distribution seen both at assemblage and regional levels. Interpretations made in the discussion about prehistoric pottery production and distribution patterns in this part of the Solomons and how they changed over time are expanded upon in Chapter 7 and discussed in detail in Chapter 10.

6.1 Overview of Ceramic Assemblage

A total of 4058 sherds were analysed from seven archaeological sites in Manning Strait (Table 6.1). These included two late Lapita intertidal sites in northwest Isabel, an inland stratified post-Lapita deposit on Sikopo in the Arnavons, an undated rockshelter in southeast Choiseul called Sao, an undated intertidal site at Nuatambu near central Choiseul, and a wide range of sites on Wagina and Laena Island dating most likely to within the last millennium. The provenance of each assemblage is described in more detail in the later sections dedicated to each region.

Table 6.1 Composition of entire ceramic collection from Manning Strait.

Site	Surface	Excavated	Sherd Count
Papatura, Santa Isabel	432	-	432
Kusira, Santa Isabel	4	-	4
Sikopo, Arnavon Islands	346	522	868
Wagina, Choiseul	1096	17	1113
Sao, Choiseul	2	-	2
Nuatambu, Choiseul	424	271	695
Laena Island, Choiseul	809	135	944
Total	**3113**	**945**	**4058**

Approximately 80% of the entire assemblage was recovered through surface collections and excavations carried out as part of this doctoral study. Exceptions included two sherds found at a rockshelter at Sao, most of the Nuatambu pottery and 40 sherds from Wagina which were collected by Miller in 1977-78. These were loaned from the Solomon Islands National Museum (SINM). A donated collection of 36 sherds, including a possible late Lapita decorated sherd (Richards 2011), collected by Rhys Richards on Nuatambu in 2008 was also included in the analysis.

6.2 Methodology

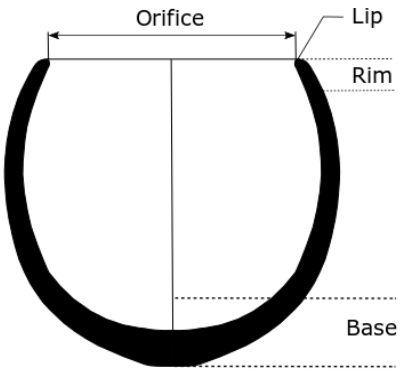
The classificatory approach take in this study draws from polythetic attribute analyses carried out by Specht (1969) and others, namely Summerhayes (2000), in the grouping of ancient Pacific pottery. A fundamental difference between these two studies was that a major aim of the former was to define and classify the pottery into ceramic styles. While for Summerhayes (2000), greater emphasis was placed instead on the identification and comparison of similarities and variation within and between ceramic assemblages. Both approaches are drawn upon in this study, however, the results of the stylistic findings of the Manning Strait assemblages are presented in this chapter more in concordance with Summerhayes (2000). Hence, precedence is given in this formal analysis to comparing differences and similarities between the decoration, form and fabric of the pottery with the intention to make inferences from these comparisons about the extent and degree of interaction between prehistoric communities in this region of Solomon Islands. Ultimately, these inferences will contribute towards addressing the research aims and questions stated in Chapter 1.

The identification and classification of the pottery into fabric groups is explained in Chapter 7. The remaining sections explain what criteria were included in the formal analysis, the process involved in classifying the pottery into vessel forms and the method used in the quantification of the vessels.

6.2.1 Selection of Attribute Criteria

The formulation of the variables and attributes utilised in this study drew from previous major archaeological ceramic analyses that have been carried out in Island Melanesia (Terrell 1976; Irwin 1985; Summerhayes 2000) as well other largescale ceramic studies specifically relevant to Solomon Islands (Specht 1969; Wickler 1991; Felgate 2003; Irwin 1972). As has commonly been practised, adjustments were made to certain variables and attributes to accommodate the entire range of variation observed for the newly acquired assemblages.

Sorting was carried out independently for each site assemblage. Once separated from the non-ceramic artefacts, each piece of pottery, including plain body sherds, was assigned a sequential Sherd Identification Number (e.g. Sherd #1, 2, etc.). They were then separated into five groups based on vessel portion and the presence of decoration: 1) rims, 2) necks, shoulders or neck/shoulders, 3) bases and other, 4) decorated body and 5) plain body. Vessel portions are illustrated in Figure 6.1.



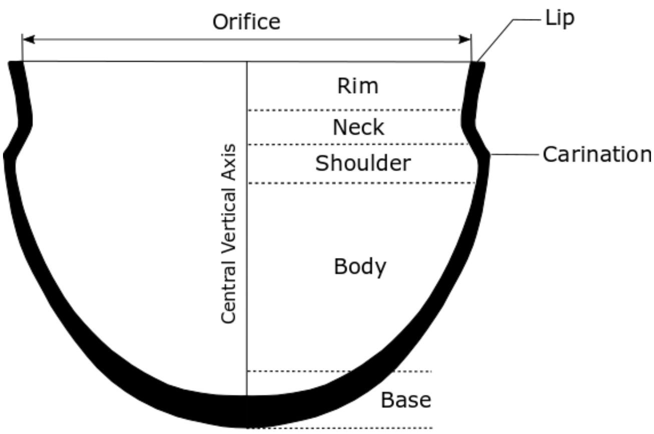


Figure 6.1 Vessel portions of an unrestricted vessel (top) and restricted vessel (bottom) used in this study (vessel shapes adapted from Irwin 1972).

The most informative sherds, or the 'formal' or 'diagnostic' sherds, comprised the first four groups. While the fifth group, the 'informal' plain body sherds, provided only a limited amount of technological and stylistic information. When determining what part of the vessel the sherd derived from, portions were sometimes combined. For instance, numerous sherds were classified as 'neck/shoulder' if they possessed the upper shoulder and lower neck. The remainder of this section explains the selection of discrete and continuous variables utilised in the formal analysis.

Discrete Variables

In addition to detailing the provenance of each sherd, 26 discrete variables were recorded (Table 6.2). The largest number of variables and attributes were recorded for rims, while the least attention was given to plain body sherds. Conjoins were recorded as their own variable, and simply involved listing which sherds conjoined (e.g. "52, 53"). Apart from temper, which is described at length in Chapter 7, each variable used in the stylistic analysis and its corresponding attributes are explained below.

Table 6.2 List of discrete and continuous variables used in formal analysis of ceramics.

Discrete Variables	
Provenance	
1. Sherd ID Number	4. Context
2. Geographic region	5. Layer
3. Site Code	6. Spit
Portion, Condition & Colour	*Technology*
7. Vessel Portion	21. External Surface Finish
8. Weathering	22. Internal Surface Finish
9. Feel	23. Forming Marks
10. Exterior Colour	24. Oxidisation
11. Interior Colour	25. Temper
12. Evidence of Burning	
Decoration	*Rim & Vessel Shape*
13. Decoration Technique	26. Rim Direction
14. Decoration Location	27. Rim Course
15. Secondary Dec. Technique	28. Rim Profile
16. Secondary Dec. Location	29. Lip Profile
17. Tertiary Dec. Technique	30. Extra Lip Features
18. Tertiary Dec. Location	31. Vessel Type
19. Motif Type	32. Vessel Form
20. Pottery Style	
Continuous Variables	
33. Rim Length	39. Sherd Height
34. Rim Thickness A	40. Sherd Width
35. Rim Thickness B	41. Sherd Area
36. Neck Thickness	42. Orifice Diameter
37. Sherd Thickness A	43. Base Diameter
38. Sherd Thickness B	44. Weight

Weathering, Feel, Colour and Evidence of Burning

Weathering. Various forms of weathering or post-depositional damage were identified. These included sherds appearing water-rolled, calcified, crushed, chipped, scratched (e.g. trowel marks), eroded or bioeroded (e.g. burrowing), pitted and any combination thereof.

Feel referred to the outer texture of the sherd and was recorded either as smooth (no irregularities felt), rough (irregularities felt) or harsh (feels abrasive to the finger). This variable was designed to gauge the overall range in smoothness of the outer surfaces of the wares. It was also useful in assessing and describing the condition of sherds as well technological differences such as fabric selection and evidence of forms of burnishing or polishing. Intertidal Papatura sherds, for example, which were almost exclusively calcareous and the most fragile assemblage, were typically highly porous and coarse to the touch.

Colour was recorded for both interior and exterior surfaces of each sherd. A Munsell colour chart was used and near the end of the analysis, informal colour categories were created and used as controls to assist in differentiating and grouping the sherds. These included orange (5YR 5/6), red (2.5YR 4/6), brown (5YR 4/6), yellow (10YR 6/6), grey (10YR 6/1), purple (2.5 YR 6/2). Black and grey sherds typically displayed evidence of burning, while the remaining colours were reflective of a combination of factors including the mixing of pastes, variation in clay sources, and differential firing temperatures (Shepard 1980: 104-13).

Evidence of burning was recorded as a separate variable to colour. No black slips were identified in this study, therefore, black or grey colouration visible on the sherds was interpreted to have likely been caused during firing or use in cooking. For each sherd, the extent of a burnt appearance was recorded using a numerical code. This ranged between zero and five: 0) absent, 1) part of exterior surface, 2) whole of exterior surface, 3) part of interior surface and 4) whole of interior surface and 5) whole of exterior and interior surfaces.

Decoration Technique and Location

Evidence of surface decoration was documented by identifying what portion of the vessel had been decorated, what techniques may have been used in the process, and what configurations of specific shapes and patterns were used. The third aspect is discussed in the next section on Motif Type. Decoration was most commonly identified on the upper portions of the vessel, specifically the rim, neck, shoulder and upper half of the body. The most dominant types of decoration were incision, impression, lip notching and other modifications to the lip. Brushing, applique, excision and punctation were less common, and only a few instances of perforation were identified. Examples of these types of decoration are given later in the chapter.

Incision. Incision is defined here as the cutting of soft clay with a sharp instrument (Shepard 1963: 195). Three different techniques identified based on the tool and manner in which it was used were linear incision, comb incision and slash incision. Linear incision and slash incision were determined to have involved single flat-edged or pointed tools, while comb incision necessitated a thin, multi-pronged or comb-like instrument. Comb incision and slash incision were observed on only a few sherds. The former appeared as deep, criss-crossing striations, and the latter, also called 'gash incision' (Irwin 1972: 65), as short, deep slashes.

The configuration of incised decoration was recorded as either bounded or unbounded incision (using Wickler 1995: 257). This was useful for differentiating between the structure and execution - essentially the aesthetic quality or skill - of the incisions. Bounded incision, for example, was characterised by well-executed finely incised lines enclosed by horizontal boundary lines or a natural boundary such as a lip or carination. While unbounded incision was characterised by generally broader lines and was less structured with no incised boundaries. Although, in some instances, unbounded incisions were bounded by neck or carination angles. Categorising incised sherds into either bounded or unbounded incision was reserved for those showing multiple incisions and some form of configuration. Highly fragmented sherds exhibiting only a single or a few incisions were simply recorded as 'linear incision' or 'slash incision', for example.

Impression. Impression is defined here as the pressing of something into the surface of the clay when soft (Shepard 1963: 194). Three different techniques observed were single-tool impression, fingernail impression and fingertip impression (pinching or pressing of clay with fingertips). Single-tool impression varied in appearance, appearing as short lines, shallow lenticular impressions, pointed deep impressions, and small rectangular, circular or triangular shapes. Fingernail impression was sometimes observed on its own, or in addition to the pinching of clay where fingernail marks would become embedded in the clay during pinching.

Lip Notching and Other Lip Modification. Lip notching is defined here as a series of impressions or notches on a lip created using a paddle or instrument (Irwin 1985: 109). Minor variations of notching were observed, and these were categorised into nine types: linear, diamond, wave, stepped, outer scoop, inner scoop, opposing scoop, U-shaped and V-shaped (Figure 6.2). It should be noted that on a few larger rim specimens, more than one variation of notching was identified. This indicated that, in addition to representing aesthetic or stylistic differences, the variation in notching may have also been created by the manner in which the pot was notched. For example, notching carried out along the lip of an unfired pot at different angles perpendicular to the lip axis would result in different forms of notching. In addition, the thickness of the edge of the paddle or instrument used to create the notches and the weight at which it was applied would also result in slight differences in appearance. Other decorative techniques observed on rims were the creation of fingertip impressions through pinching of the lip, crenulation – also called 'wavy' or undulated rims – and more subtle modifications of the lip such as flattening, grooving, and thickening of the top, outer and/or inner lip.

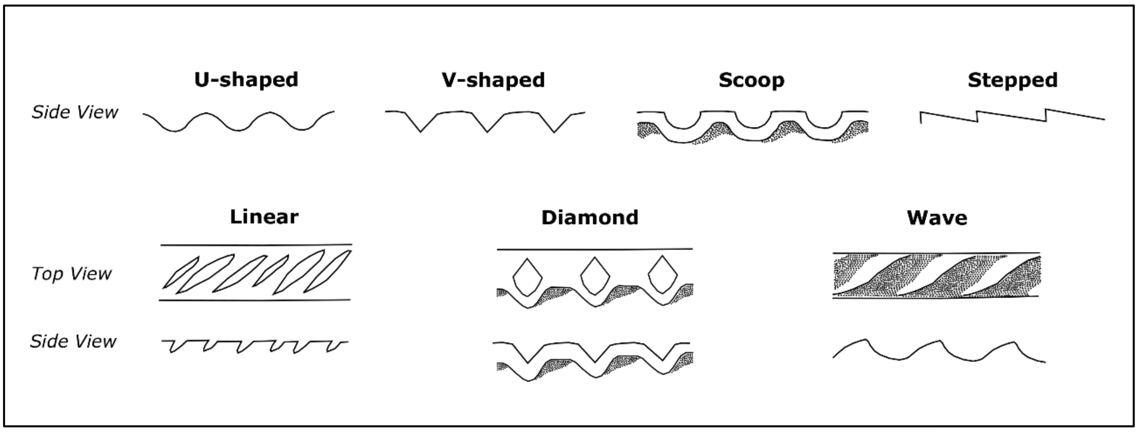


Figure 6.2 Lip notching varieties identified from Manning Strait ceramics.

Other techniques. Applique, which is the process by which a separate piece of clay is added to a vessel, was only identified in the form of the addition of clay strips. Excision or the carving out of the clay was observed on a few sherds. For the Papatura assemblage, this technique was uniquely accompanied with the displacement of the carved-out clay into the form of nubbins which were moulded into distinct hourglass shapes. Punctation appeared occasionally as small, circular inverted nubbins. A few examples of perforation were identified, although it was sometimes difficult to determine whether the holes were created from a post-depositional effect. Light brushing was observed, appearing as very fine striations usually on the outer but also on the inner surfaces of sherds. This form of decoration is likely to have been done as a finishing touch before firing to burnish the vessel. The use of lamplight was effective in identifying evidence of light brushing.

Motif Type

Motifs, defined here as a repeatedly used decorative image that is "made up of one or more different design elements" (Chiu and Sand 2005: 139), were recorded using a combination of Anson's (1983) list of coded Lapita motifs and motifs recorded by Felgate (2003: Table 15). Decorated post-Lapita pottery from Shortland Islands photographed by Irwin (1972) were also compared against. If decoration on a sherd was sufficient to be considered as a complete motif, which occurred rarely and for mainly large sherds, this variable was recorded by assigning the sherd a motif which it most closely resembled. Motifs were not examined in any comprehensive manner in this study but rather served as a comparative exercise to assess patterning in reoccurring decorative configurations between the Manning Strait assemblages and with prehistoric assemblages from neighbouring regions.

Pottery Style

Pottery styles previously formulated in ceramic sequences created for Buka (Specht 1969; Wickler 2001) and the New Georgia group (Felgate 2003) were included in the formal analysis for comparative purposes. This involved assigning each formal sherd to one of these styles which it most closely resembled based on its decorative appearance and vessel form. Sherds were not assigned a style if they exhibited little decoration and no vessel form. Additionally, two styles were sometimes listed for ambiguous cases.

Surface Finishing, Forming Marks and Oxidisation

Surface finishing referred to evidence of a decorative finish of the vessel that was visible on the sherd. The different treatments identified included burnishing or some form of wiping that created a smoothened or polished surface, slip, paint and sometimes combinations of these.

Forming marks referred to evidence of the technique used in the construction and moulding of the vessel prior to firing. The different attributes recorded were none, finger or fingernail impressions, anvil and paddle impressions, slab or moulding marks and hand-spinning. No evidence of coiling was identified, and this was unsurprising as ethnographic accounts dictate paddle and anvil to be the dominant practice in Shortland Islands and Choiseul while coiling to be the norm further north in

Bougainville and Buka (Whitney 1968; Ratliff 1979; Blackwood 1935: 401; Specht 1972).

Oxidisation. The extent of oxidisation of each sherd was recorded as either complete, light (grey) core or dark core using Orton *et al.* (1993: Fig. 11.1) as a guide. This was noted to make comparisons between the assemblages regarding the success of pot firing which is largely impacted by air circulation (Ellis 2013: 212). Generally, sherds recorded as complete were reflective of a well-fired vessel while those with dark cores were indicative of a poorer firing within a reduced atmosphere typically richer in carbon monoxide. This attribute is not always a straight-forward indication of firing quality, however, as Rye and Allen (1980) have highlighted that the presence of organic material can influence the discolouration of the core of a pot sherd under oxidising firing conditions.

Rim and Lip Features

Five variables were used to classify the wide variety seen in rim shape (adapted from Summerhayes 2009: 35; Gaffney 2016: 202-204). These were rim direction, rim course, rim profile, lip profile and extra lip features (Figure 6.3).

Rim direction refers to the direction in which the rim is travelling in relation to the central vertical axis of the vessel body (Poulsen 1987: 29). Classifying rim direction involved placing each rim lip-down onto a level horizontal surface and moving it back and forth until the lip made contact with the surface most completely (following Rice 1987: 222; Summerhayes 2000: 35). The rim direction of small fragments of a rim or those with damaged lips were left unassigned if they lacked sufficient circumference. Five rim directions were identified in the analysis: incurving, outcurving, everted, inverted and direct. Everted and inverted rims were characterised by possessing an interior corner point. Incurving and outcurving rims have inflection points and no distinct corner points. They differed by the former curving in or towards the central ventral axis of the vessel while the latter curved outwards or away from the central vertical axis. Direct rims follow the outline of the vessel with no considerable change in direction.

Rim course refers to the shape of the rim axis, an imaginary line that runs through the rim between the lip and body (Irwin 1985: 105; Poulsen 1987: 29). The course of a rim can either be straight, which is almost always the case with direct rims, or curved. The variation in curvature of a rim course was described either as convex, concave or sigmoid (convex-concave) (following Gaffney 2016: 202).

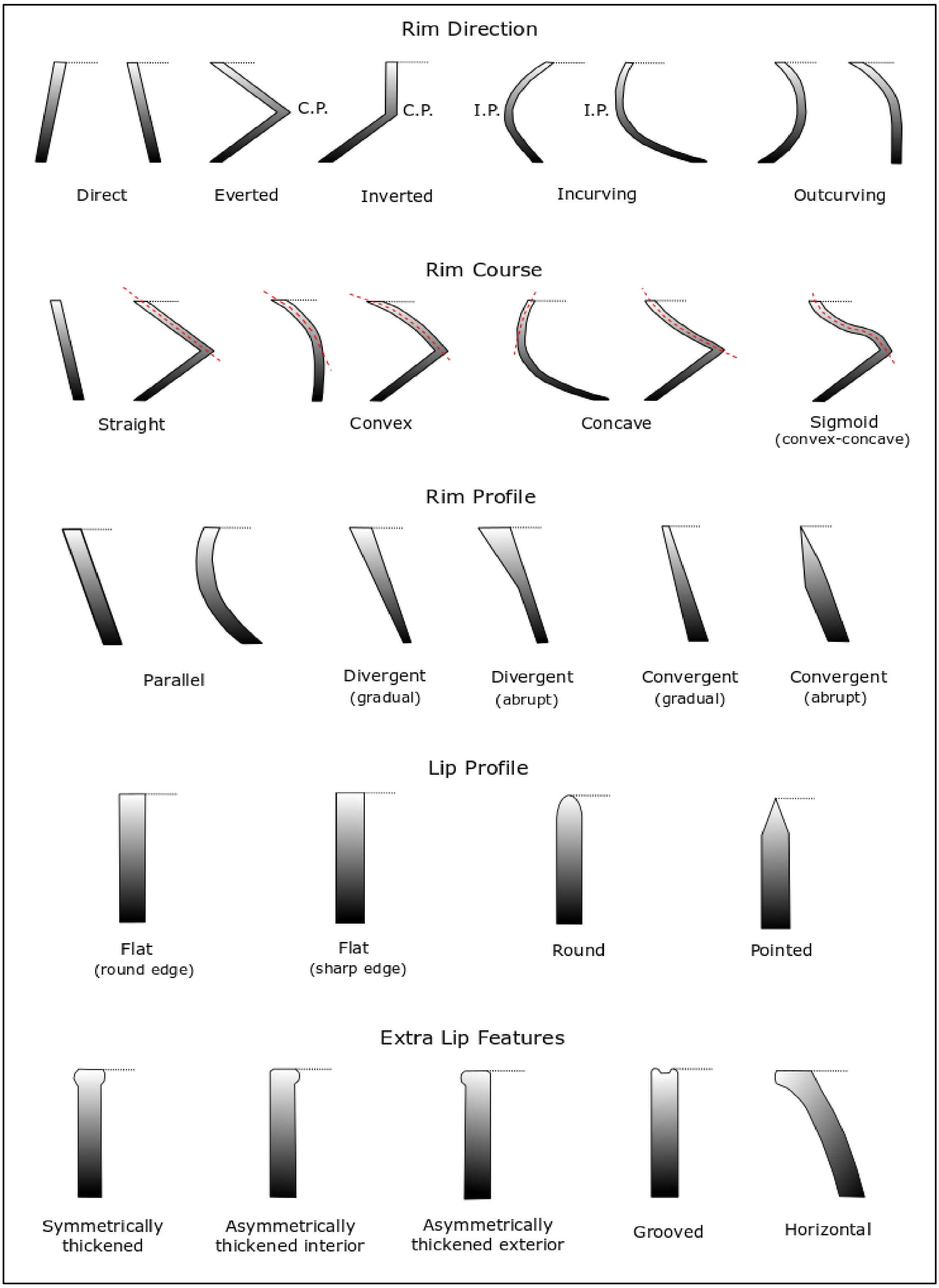


Figure 6.3 Rim and lip feature attributes.

Rim profile is the cross-section of a rim and is useful for differentiating between variation seen in the thickening of vessels in their course towards the lip. Four main types of rim profiles were observed in the analysis: parallel, lenticular, convergent (abrupt or gradual) and divergent (abrupt or gradual) (following Irwin 1985).

Lip profile is defined as the end point of a rim (Summerhayes 2000: 36). Four types of lip profiles were identified: pointed, round, and flat with rounded or sharpened edges.

Extra lip features was a category used to accommodate finer differences in the thickening and shaping of rims not encompassed by the lip profile variable. Four extra lip features were identified (using Summerhayes 2000: Fig. 4.5): symmetrically thickened, asymmetrically thickened exterior (grooved or not grooved), asymmetrically thickened interior, and horizontal. Although this category proved useful for describing the variation observed in this study, it should be noted as previous studies have done (Gaffney 2016: 203) that minor variations such as the symmetrical shape of the lip may have been attributed to chance and mechanical differences in the manner or position in which rims were moulded.

Vessel Type and Form

Vessel type was recorded as either 'unrestricted' or 'restricted' and *vessel form* was classified using vessel forms largely inspired by Summerhayes (2000: Fig. 4.1-4.3). Unrestricted vessels consisted of two forms: open bowls/cups with outward rim/wall orientation (Form I) and open pots/bowls with direct rim/wall orientation (Form II). Restricted vessels comprised four forms: jars with horizontal rims and restricted necks (Form III), jars with outcurving rims, restricted necks and carinations (Form IV), pots with everted or inverted rims and globular bodies (Form V), and vessels with inward restricted upper vessel form such as direct or incurving jars and pots (Form VI). No vessel stands and open bowls with horizontal rims – Summerhayes' (2000) Form VIII and Form III vessels, respectively - were identified in the Manning Strait assemblages.

These vessel shapes, although designed from the analysis of Lapita-period ceramic ware, were used for two reasons. Firstly, they accommodated almost all the morphological variation observed in this study. Secondly, they are easily comparable with other vessel forms described in Pacific ceramic studies which is valuable when making inter-site and regional comparisons. Vessel shapes illustrated by Irwin (1972: Fig. 58-61) from the analysis of post-Lapita assemblages from the Shortland Islands were also used to supplement vessel form groupings.

All formal sherds, except body sherds, were categorised using these vessel forms. Although due to their fragmentation, it was not always possible to confidently assign them to a single vessel form. Following the completion of the formal analysis, a list of six vessel forms were formulated specifically for the variation observed in the Manning Strait assemblages and these are described and illustrated in section 6.2.2 (Figure 6.5).

Continuous Variables

Continuous variables recorded in this study included rim length, rim and neck thicknesses, sherd height, width and thickness, sherd area and orifice and base diameter (Figure 6.4). A plastic and digital calliper were used interchangeably. Measurements were taken to the nearest millimetre or gram.

Rim Length and Rim and Neck Thicknesses

Rim length refers to the distance between the lip and neck running through the rim axis. This measurement was often only possible to be recorded precisely for everted and inverted rims, although estimates were able to be taken for some of the more intact outcurving and incurving rims.

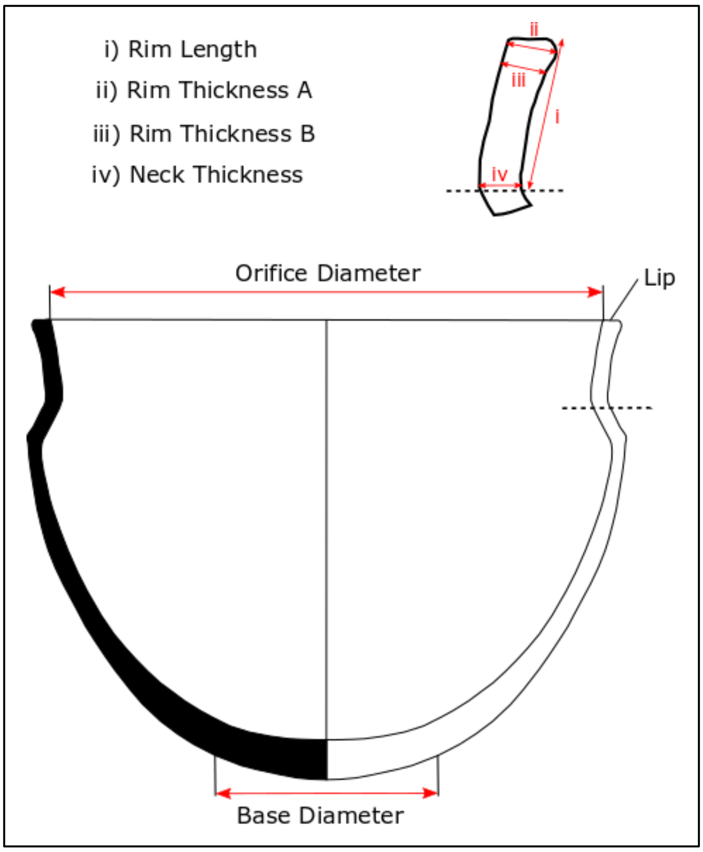


Figure 6.4 Metric variables recorded in formal analysis of pottery.

For rim and neck thicknesses, three points were measured. Rim thickness A was taken "at the point of maximum or minimum thickness on expanded and reduced rims, and at the lip of those of constant thickness" (Specht 1969: 79). Rim Thickness B was measured "just below the points of origin of abrupt expansion or reduction; at least 1 cm below the lip on direct rims of constant thickness, (or) on differentiated rims… just below the point of differentiation" (Specht 1969: 79). Neck thickness referred to the distance between the interior and exterior surfaces immediately below the rims.

Sherd Height, Width and Thickness

Sherd height refers to the maximum distance of the sherd corresponding to the central vertical axis of the vessel. For necks, shoulders and carinations, attempts were made to firstly orient each sherd accordingly before measuring both sherd height and width. For sherds which were not orientable, the longest axis of the sherd was measured as height. Sherd width was measured at a right angle to the determined sherd height axis.

For neck, shoulder and carination sherds, three points of each sherd were measured for thickness: neck thickness, the thickest point of the sherd and the narrowest point. For body sherds, only maximum thickness was recorded.

Sherd Area

Sherd area refers to the surface area of a sherd and was measured following Felgate (2003: 198) who placed emphasis on recording sherd size in testing and understanding taphonomic processes in sherd survival (Felgate *et al.* 2013). Each sherd was placed on top of a sheet of paper which contained 1 cm^2 grids, then was adjusted to determine the largest number of grid squares (or the maximum surface area) that the sherd covered. As sherds were rarely square in shape and did not fit in line with the grid squares, an estimation was recorded to the nearest 0.5 cm^2.

Orifice and Base Diameter

Orifice diameter, which is the maximum width of the mouth of the vessel, was measured using a rim chart with one cm intervals (e.g. Summerhayes 2000: 36; Rice 1987: 223). The lip of each rim sherd was placed on top of the concentric circles in increments from the centre of the rim chart and the diameter which most accurately matched the curvature of the rim was selected. The correct rim stance upon which to place the rim on the chart was established following Joukowsky (1980: 442) and Summerhayes (2000: 35) who suggest turning the rim upside down on a horizontal surface and moving it back and forth until no light escapes between the rim edge and surface. Base diameter, which is the maximum width of the underside or bottom of the vessel that makes contact with the ground, was measured in a similar manner using the one cm interval diameter sheet.

6.2.2 Classification of Vessel Forms

Classifying the Manning Strait pottery into vessel forms involved assessing the entire variation in the shape of rims, necks, shoulders, carinations and bases to identify reoccurring patterns in their form. This process began by working from the known – namely rims, large portions of pots and conjoined segments - then proceeding to the unknown, using smaller formal sherds in combination with other attributes such as fabric and decoration. The most important factors in determining vessel form for this analysis were rim sherds and their orientation, although all vessel portions were attempted to be integrated in the classification scheme.

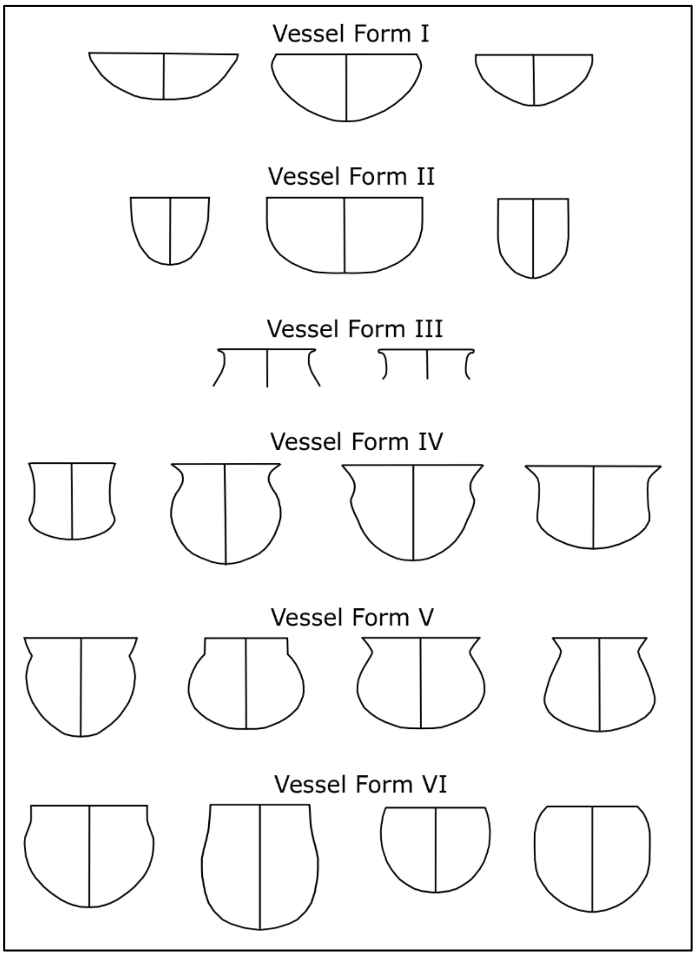


Figure 6.5 Vessel forms used in formal analysis. (Adapted from Summerhayes 2000 and Irwin 1972).

Six vessel forms were identified following the formal analysis of the Manning Strait assemblages (Figure 6.5). These were open bowls/pots (Forms I and II), an everted or outcurving pot with a horizontal rim (Form III), outcurving pots (Form IV), sharply carinated pots (most likely Form IV), inverted and everted pots (Form V) and inward/direct restricted jars and pots (Form VI). The vessel forms used to group the Manning Strait pottery represented gross identifications of form, essentially 'vessel families', and were used to avoid the confusion of vessel typologies in which almost every variation of shape is categorised as a new vessel type (following Summerhayes 2000: 33).

6.2.3 Quantification

The minimum number of vessels (MNV) was calculated for each site primarily based on rim data. This included a basic count of the number of rims, following refitting, and taken into consideration other attributes such as sherd thickness, fabric, decoration, rim direction, rim profile, lip profile and extra lip features. Other vessel portions were used, specifically necks, neck/shoulders, carinations and bases, where it was determined that they could not be associated with any of the rims. Visual comparisons and refitting were carried out for all assemblages, and for excavated deposits, MNV was calculated for each spit and layer.

Across all sites, MNV estimations were generally low (Table 6.3). No rims were collected from Kusira and Sao so these sites are not included in Table 6.3. The highest MNV for individual site complexes were calculated for Papatura and Nuatambu, both intertidal sites. The MNV calculated for Laena Island included rims recovered from three separate site complexes. Similarly, the total MNV for Wagina comprised rims collected from four separate site complexes. More detailed descriptions of MNV estimates for each of the sites, which include the addition of non-rim data, are given in sections 6.3.2, 6.4.2 and 6.5.2.

Table 6.3 Total number of rims and minimum number of vessels (MNV) based only on rims for Manning Strait assemblages.

	Surface		*Excavated*		
Site	**Rim No**	**MNV**	**Rim No**	**MNV**	**TOTAL MNV**
Papatura, Santa Isabel	32	29	-	-	29
Sikopo, Arnavons	3	3	14	13	16
Wagina, Choiseul	21	20	1	1	21
Nuatambu, Choiseul	5	5	22	19	24
Laena Island, Choiseul	35	31	11	10	41
Total	96	88	48	43	131

6.3 Santa Isabel Pottery

A total of 436 sherds were recovered from surface collections on Papatura Ite Island and at Kusira located on the island of Barora Faa in northwest Isabel. Four sherds were collected during a brief visit to Kusira from its intertidal mudflat. The remaining 432 sherds were found within an intertidal zone on the southern coast of Papatura between the mouth of a small freshwater stream and the edge of the low tide mark located about 30-40 m from the shoreline.

These intertidal assemblages, having been impacted by waves and tidal fluctuations, were in a poorer condition than the remaining assemblages. Many of the sherds crumbled easily and appeared eroded or water-rolled which sometimes made assessing evidence of decoration difficult. The average sherd size or sherd area for the Papatura assemblage was 6.18 cm^2. This was noticeably small compared to other intertidal assemblages recorded in Roviana Lagoon (Table 6.4), which in turn suggests a high degree of post-depositional fragmentation of the assemblage. Further comparisons between Papatura and late Lapita intertidal sites recorded in the New Georgia group are made in Chapter 10.

Table 6.4 Total sherd count and average sherd area for Papatura and Roviana intertidal assemblages (adapted from Felgate 2003: Table 22).

Intertidal Site	Sherd Count	Av. Sherd Area (cm^2)
Papatura	432	6.18
Hoghoi	861	10.94
Zangana	860	13.59
Paniavili	644	14.65
Nusa Roviana	115	15.83
Gharanga	277	17.96
Miho	382	22.08
Honiavasa	442	28.25
Kopo	25	33.24

6.3.1 Decoration

Of the 432 Papatura sherds, approximately 16% (N=69) exhibited surface decoration. This included 30 of the 32 rims found at the site, just under half of the neck, shoulder and carination portions, and about 3.3% of the body sherds (Figure 6.6). The Papatura assemblage exhibited the highest variety in decoration compared to the other Manning Strait assemblages. In addition to lip notching and other forms of lip modification which are described in the next segment on rim decoration, seven forms of decoration were identified in the Papatura assemblage. These were incision, impression, applique, excision, brushing, punctation and a possible example of perforation. The most dominant of these were fingernail, fingertip and single-tool impression, and linear incision (Figure 6.7). The remainder of this section describes the decoration of rims and of neck, shoulder and body sherds in more detail. Evidence of red-slip decoration is also given.

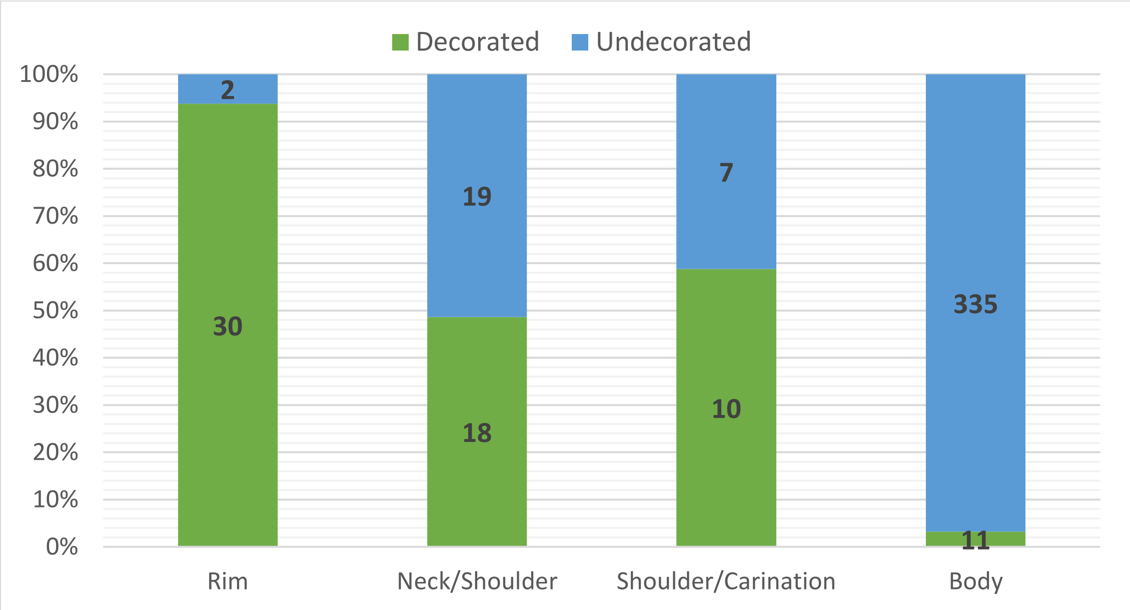


Figure 6.6 Histogram showing proportion of decorated to undecorated sherds for Papatura assemblage (bolded numbers represent number of sherds).

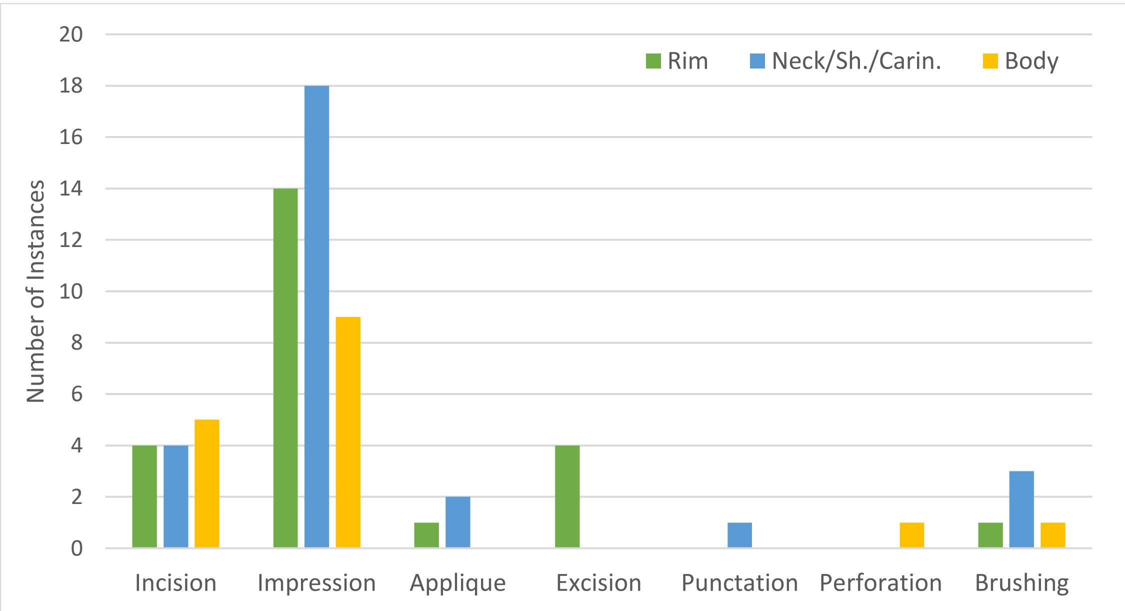


Figure 6.7 Types of decoration identified in Papatura assemblage and number of instances each type was observed (e.g. Sherd #1 decorated with incision and impression = one instance for incision and one for impression).

Rim Decoration

The Papatura sample was the only assemblage possessing crenulated or 'wavy' rims, and overall, almost every rim sherd displayed a unique combination of types of decoration (Table 6.5). The most common forms of rim decoration were fingertip and fingernail impression, crenulation and other forms of lip modification such as flattening, thickening and grooving of the lip. Notching was uncommon, and apart from one crenulated rim sherd with opposed fingernail impression (PAP 3850) and another with a possible gouge in its outer lip (PAP 3918), most of the crenulated rims were plain (Figure 6.9).

Table 6.5 Papatura rim types with their various combinations of decoration (sherds conjoined first then counted only once).

Crenulated Rims	**Count**
Crenulated	6
Crenulated + fingernail impression (opposing)	1
Crenulated + possible excision	1
Total	*8*
Fingertip & Fingernail Impressed Rims	**Count**
Fingertip imp. + brushing/wiping	1
Fingertip imp. + excision	2
Fingertip imp. + fingernail imp.	1
Fingertip imp. + fingernail imp. (opposing)	2
Fingertip imp. + fingernail imp. (opposing) + incision	1
Fingertip imp. + thickened & flattened lip	1
Fingernail imp. (opposing) + incision + thickened lip	1
Fingernail imp. (opposing) + flattened lip	2
Total	*11*
Notched Rims	**Count**
V-shaped	1
U-shaped + grooved lip	1
U-shaped + flattened lip + impressed crease	1
Diamond + flattened lip + incision	1
Total	*4*
Applique & Excised Rims	**Count**
Thin strip + thickened & flattened lip	1
Excision + hourglass + flattened lip + wiping	2
Total	*3*
Other Rims	**Count**
Flattened lip	1
Flattened & thickened lip	1
Flattened & grooved lip + linear impression	1
Thickened lip + incision	1
Total	*4*

One of the notched rims was also decorated with an 'impressed crease' (Figure 6.9: PAP 3812). This subtle feature appeared as an indented crease that would have most likely been created by the potter pressing and sliding their thumb along the neck. The most intricately decorated rim sherds were characterised by close detail given to modification of the lip either in the form of fingertip impression, consecutive fingernail impressions or shaping of the lip to be flat, thick, grooved or to possess an overhanging outer lip (Figures 6.10 & 6.11). The necks of these rim sherds were typically decorated with opposing fingernail impressions appearing as bands running diagonally to the central vertical axis of the vessel. This was sometimes accompanied by bounded incision appearing as geometric shapes or chevron patterns. A single instance of strip applique was identified for a small unrestricted vessel (PAP 2217) as well as a form of excision and displacement of clay into small hourglass shapes (PAP 2120) (Figure 6.12).

Neck, Shoulder and Body Decoration

The most dominant forms of decoration observed on the neck, shoulder and carination portions of the Papatura vessels were opposing fingernail impressions and linear impressions (Table 6.6). One shoulder portion with a large zone of decoration was decorated with both linear impression and curvilinear incisions which formed an arrow design (Figure 6.10: PAP 2237). Another, a neck/shoulder sherd, was decorated with an elaborate bounded incised design that appeared similar to a Lapita labyrinth motif (Figure 6.10: PAP 3851).

Two neck/shoulder sherds were decorated with applique. One with a rounded strip running diagonally up the neck (Figure 6.10: PAP 3881) and the other with a flat strip moulded onto the base of the neck (Figure 6.11: PAP 4005). Punctation was identified on a single shoulder portion, below the base of the neck (Figure 6.11: PAP 3809). This sherd was also one of two shoulder sherds which displayed evidence of brushing or wiping of the exterior clay surface.

For the small portion of body sherds identified to possess decoration, impression and incision were the most common types (Table 6.6). Two examples showed evidence of a rectangular-shaped impression, most likely created using a small, thin and single-headed tool. There was also a sherd with a possible slash incision and another with a potential perforation (Figure 6.8).

Table 6.6 Decoration combinations identified for Papatura neck, shoulder, carination and body sherds (sherds conjoined then counted as one).

Neck sherds		**Count**
Incision		1
Applique		1
Applique + possible fingernail imp.		1
	Total	*3*
Neck/shoulder sherds		**Count**
Incision (chevron + rectangle)		1
Linear impression		4
Linear impression + fingertip imp.		1
Fingernail imp. (opposing)		5
Fingertip imp.		1
Possible impressed crease		1
Brushing/wiping		1
	Total	*14*
Shoulder/carination sherds		**Count**
Incision (arrow) + linear impression		1
Linear impression		1
Rectangular impression		1
Fingernail imp. (opposing)		4
Fingernail imp. (opposing) + incision		1
Punctation + brushing/wiping		1
	Total	*9*
Body sherds		**Count**
Incision		4
Possible slash incision		1
Linear impression		2
Rectangular impression		2
Possible perforation		1
Brushing/wiping		1
	Total	*11*

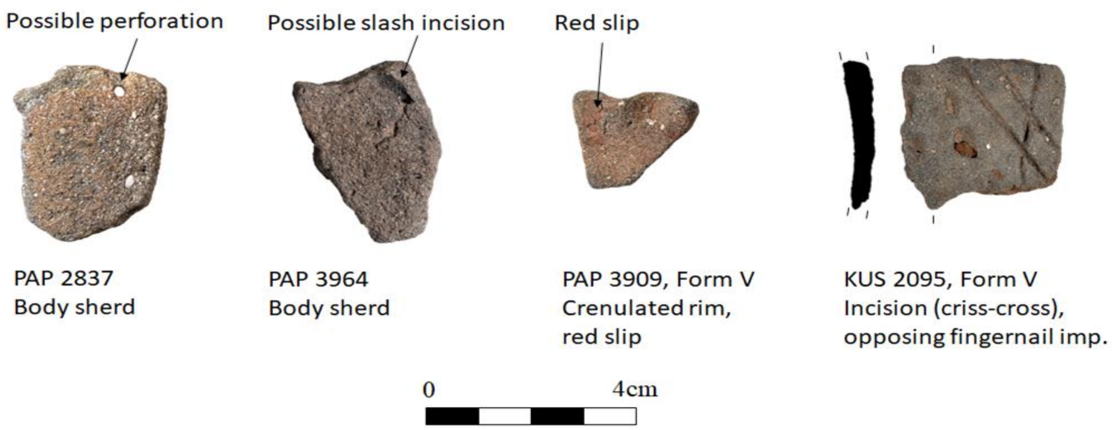


Figure 6.8 Papatura decorated body sherds, red-slip example and single Kusira decorated neck/shoulder sherd.

Traces of red slip were occasionally identified on the outer vessel surface, but sometimes also the inner surface, in two hues of brownish red: a vibrant hue (5YR 5/6) or more faded one (5YR 5/4) (Figure 6.8). Slip was identified on 18.8% (N=6) of the rims and only 11.1% (N=6) of the neck/shoulder/carination sherds. It is likely, however, that most of the vessels were originally decorated with red slip which has since deteriorated.

Of the four Kusira sherds, only one, a neck/shoulder portion, was decorated with diagonal, criss-crossed linear incisions and an opposing band of fingernail impression (Figure 6.8: KUS 2095). The shape of the sherd suggests the vessel is likely to have been carinated with an outcurving rim, resembling a Form IV jar.

6.3.2 Vessel Form

Five vessel forms were identified: outcurving pots with carinated or globular bodies (Form IV), everted pots (Form V), open bowls/pots (Forms I and II) and a single horizontal rimmed jar (Form III). As no bases were identified, classification was based predominantly on rim shape and direction as well as body shape. The assemblage was dominated by restricted outcurving pots possessing either carinated or globular bodies (Table 6.7). Globular bodied vessels possessed either a gentle carination or lacked any form of carination altogether. Form IV accounted for 58.6% of the total MNV, followed by Form V pots which comprised 20.7%. The remaining vessel forms were represented in equally low numbers.

Table 6.7 MNV for Papatura vessel forms identified from each vessel portion (sherds conjoined then counted as one).

Portion	I	II	III	IV	V	Total
Rim	3	2	1	17	2	25
Neck/shoulder	0	0	0	7	4	11
Carination	-	-	0	2	0	2
MNV Total	*3*	*2*	*1*	*17*	*6*	*29*

Form IV

At least 17 outcurving restricted vessels were identified in the assemblage (Figures 6.9 & 6.10). Examination of the neck/shoulder portions categorised in this vessel form indicated that the majority of these vessels appear to have been characterised by globular bodies with gentle or non-existent carinations. This was not able to be determined confidently, however, as only one distinct carination and one gentle carination were identified (Figure 6.10). These vessels exhibited the widest range in decoration, and was the only form decorated with crenulated or wavy rims.

Form III

Only one rim sherd, a small horizontal rim fragment, was classified as Vessel III (Figure 6.9: PAP 2279). The slight curvature of the rim suggests it belonged to an outcurving or everted vessel. Also, it is likely the vessel was carinated as was the case for horizontal rim fragments identified in Roviana intertidal assemblages by Felgate (2003: Fig. 57).

Figure 6.9 Papatura Form III (bottom right) and Form IV (remainder) rim varieties.

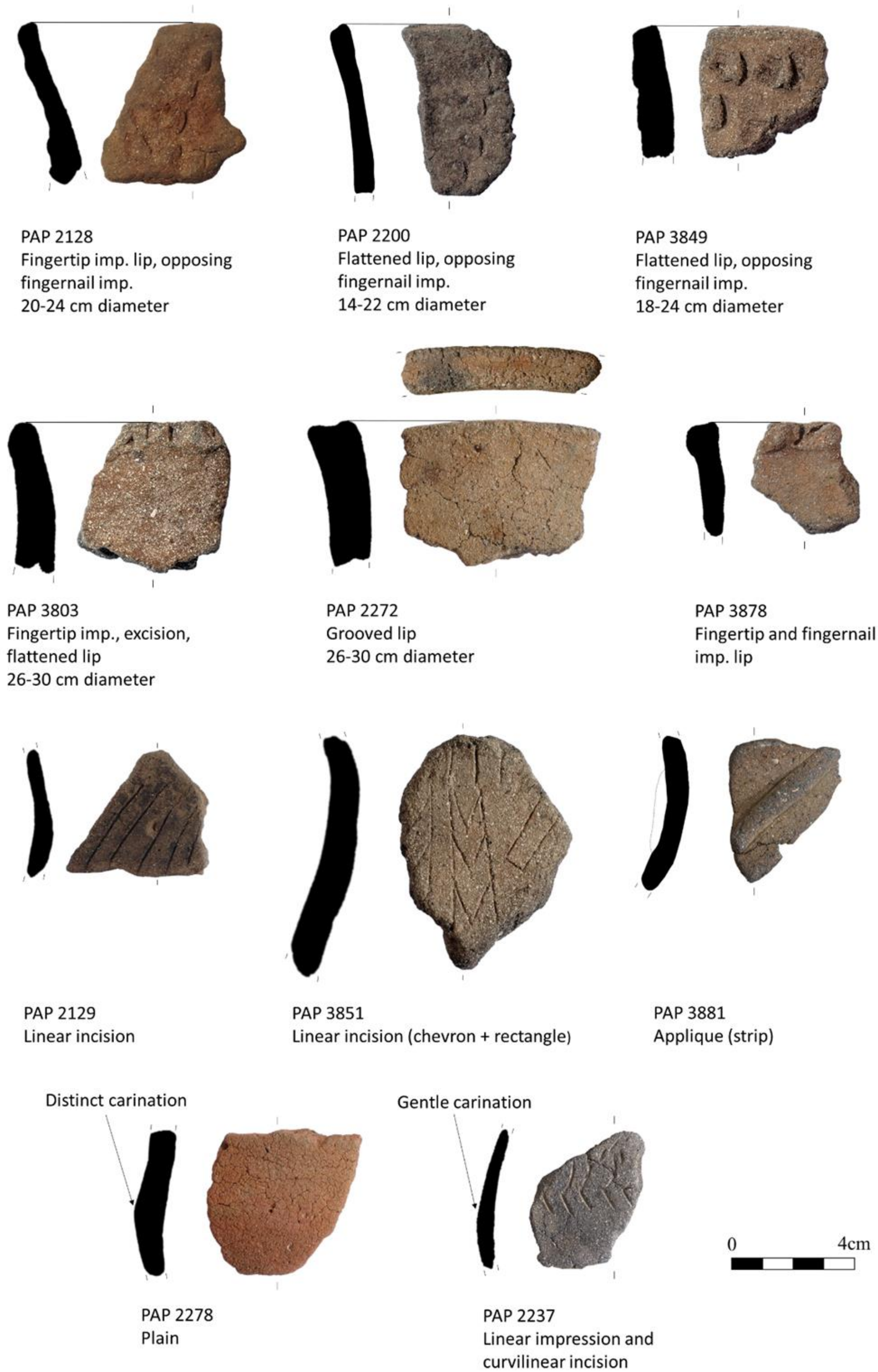


Figure 6.10 Papatura Form IV rims (top two rows), necks (third row) and carinations (bottom row).

Form V

Six everted pots were identified based on two everted rims and four neck sherds (Figure 6.11). The two rims were intricately decorated with opposing fingernail impressions and chevron or triangular-shaped incision. One of these, PAP 2295, appeared identical to a Miho style rim sherd identified by Felgate (2003: A.17, Fig. 12). The relatively acute – or close to 45 degree - rim inclination of the two rims and single neck sherd suggest a globular body shape. However, carinated body shapes cannot be ruled out.

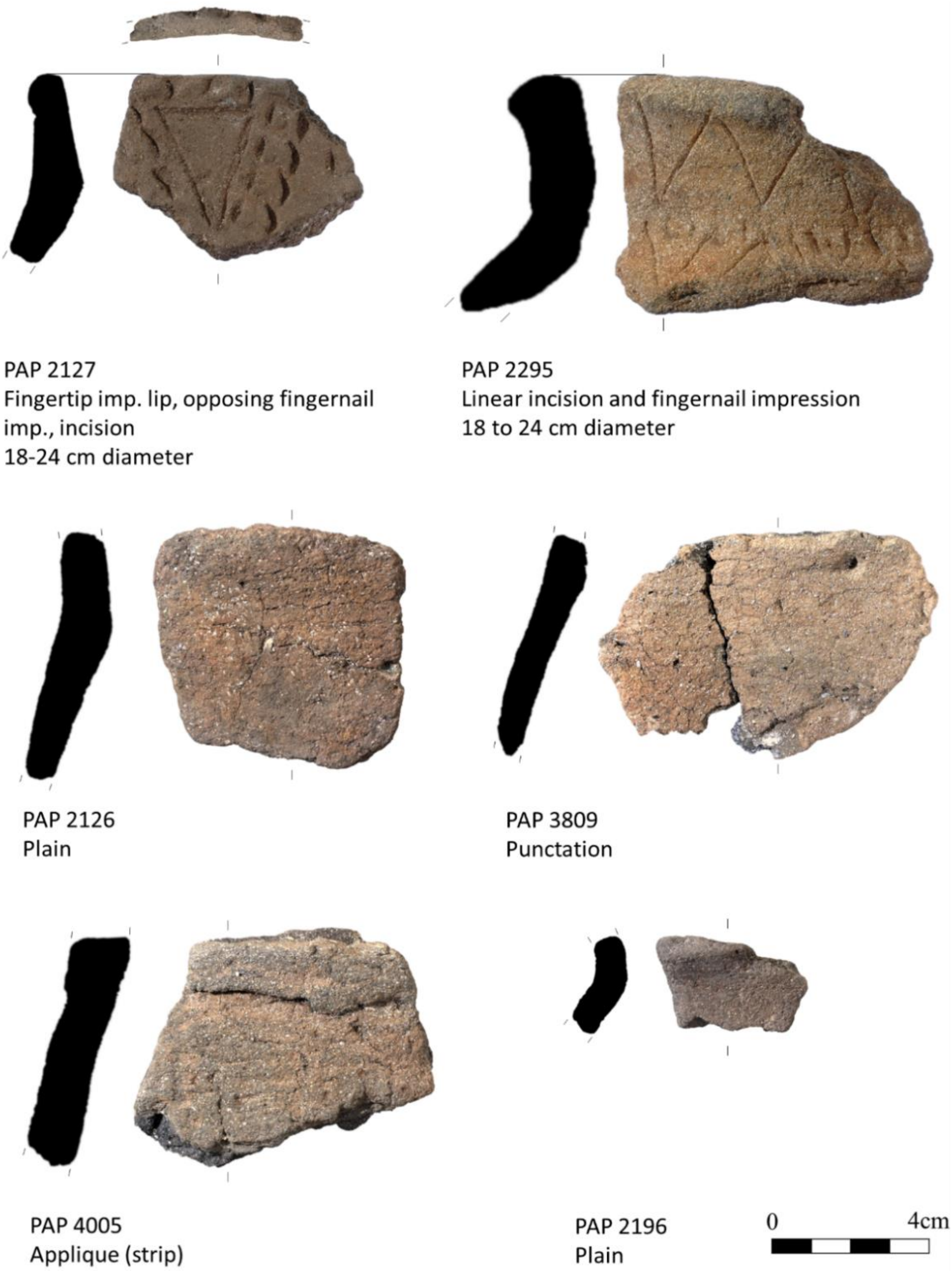


Figure 6.11 Papatura Form V rim (top row) and neck (bottom two rows) sherds.

Forms I & II

Five unrestricted vessels were identified, three with outward rim/wall orientations (Form I) and two with direct rim/wall orientations (Form II) (Figure 6.12). The Form I vessels included a shallow, thick-based bowl decorated with linear incision, a wide and thin-walled bowl decorated with excision, applique and wiping of the outer body, and a very small bowl or cup decorated with applique. PAP 3810 was the only vessel in the assemblage exhibiting evidence of incision of the upper lip; lip decoration was more commonly applied to the outer lip and sometimes inner lip. The Form II vessels were generally deeper and wider, and one was decorated with fingernail impression.

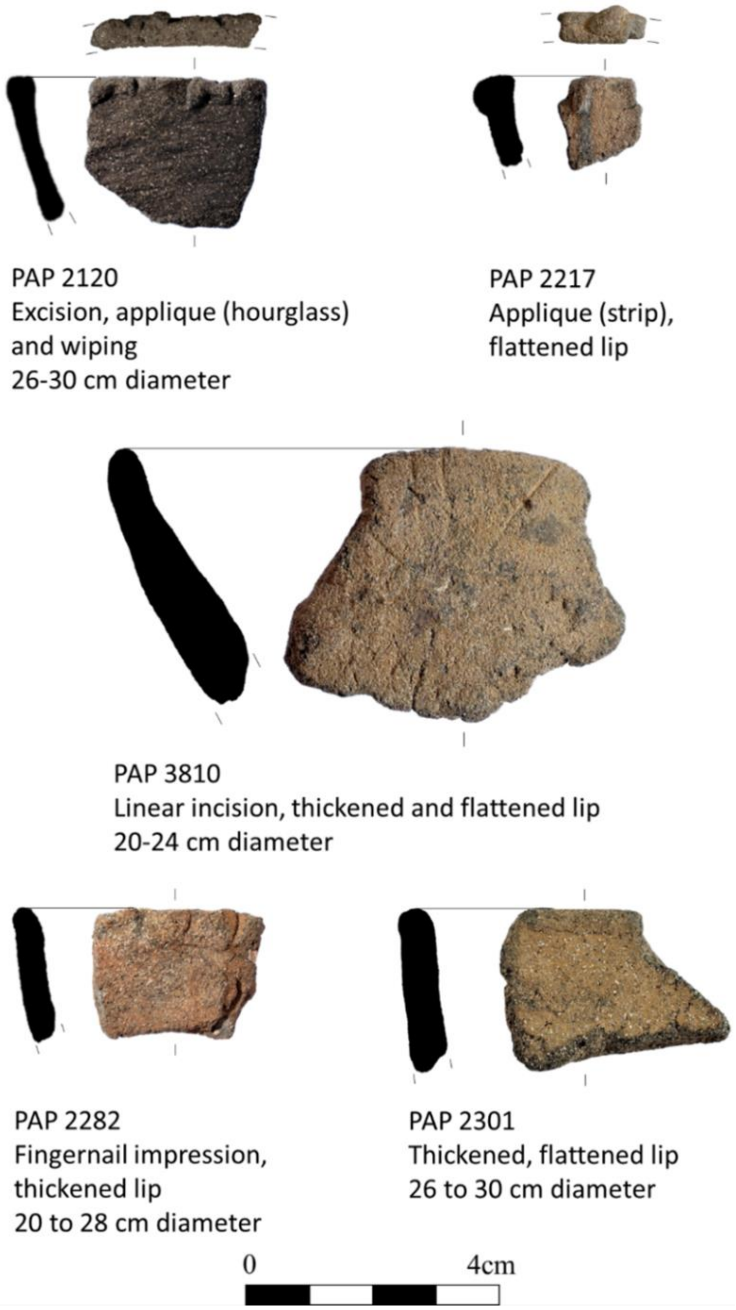


Figure 6.12 Papatura Form I (top two rows) and Form II (bottom row) open bowls/pots.

6.4 Arnavon Islands Pottery

A total of 868 sherds were collected from three sites on Sikopo (Table 6.8). These included Area A (SIK-1), a 700 m^2 artefact scatter and roughly 1 m deep cultural deposit located adjacent to a large coral outcrop, Lianga Tafa (SIK-2), a large cave, and a large coral mound shrine, Shrine F33 (SIK-3). Approximately 98% of the entire assemblage derived from Area A, the majority of these from a 3 m^2 excavation carried out there. On average, the excavated sherds were very small and exhibited a higher degree of fragmentation compared to sherds found on the surface of Area A.

Table 6.8 Distribution of pottery found at Sikopo sites with corresponding average sherd size and average sherd thickness.

Context	No Sherds	Av. Sherd Area (cm^2)	Av. Thickness (mm)
Area A (excavated)	517	2.9	5.3
Area A (surface)	339	4.3	4.9
Lianga Tafa	5	3.5	3.6
Shrine F33	7	4.9	9.4
Total	868	3.9	5.8

The remainder of the Sikopo pottery assemblage comprised five water-rolled, undecorated body sherds found 30-35 cm deep in a test pit in Lianga Tafa, and seven undecorated body sherds found clustered together on top of Shrine F33. No vessel form was ascertained from the sherds found on the shrine. Although their minerology suggested the vessel was distinctive from the remainder of the Sikopo assemblage, and its most likely geological origin is described in Chapter 7.

6.4.1 Decoration

Of the 868 Sikopo sherds, approximately 11.5% (N=100) displayed surface decoration. This included 14 of the 17 rims found at the site, just under half of the neck, shoulder and carination sherds, and 7% (N=51) of the body sherds (Figure 6.13). Five sherds which were classified as base fragments possessed no surface decoration. Overall, the assemblage exhibited minor variation in surface decoration. Four forms of decoration were identified, the most dominant of which were incision, lip notching and impression (Figure 6.14). Evidence of brushing or wiping of the exterior and sometimes interior sherd surfaces was encountered on 17 sherds. This appeared as patches of very thin, parallel striations which were determined to have been created during burnishing (Figure 6.19: SIK 78).

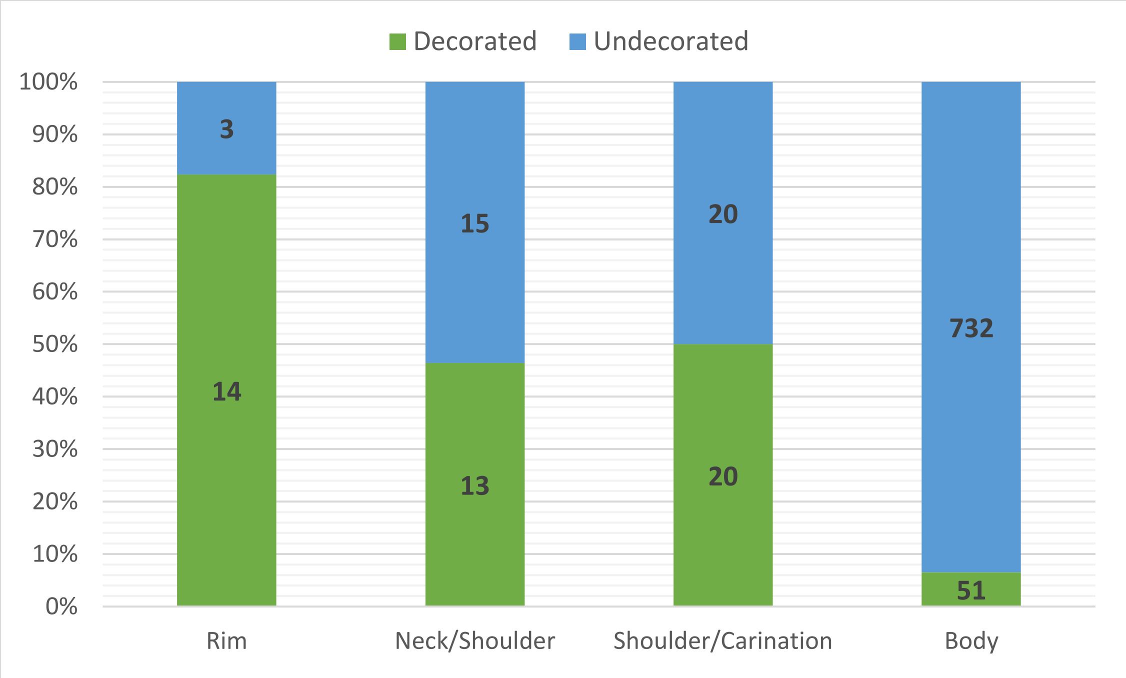


Figure 6.13 Histogram showing proportion of decorated to undecorated sherds for Arnavon Islands assemblage (bolded numbers represent number of sherds).

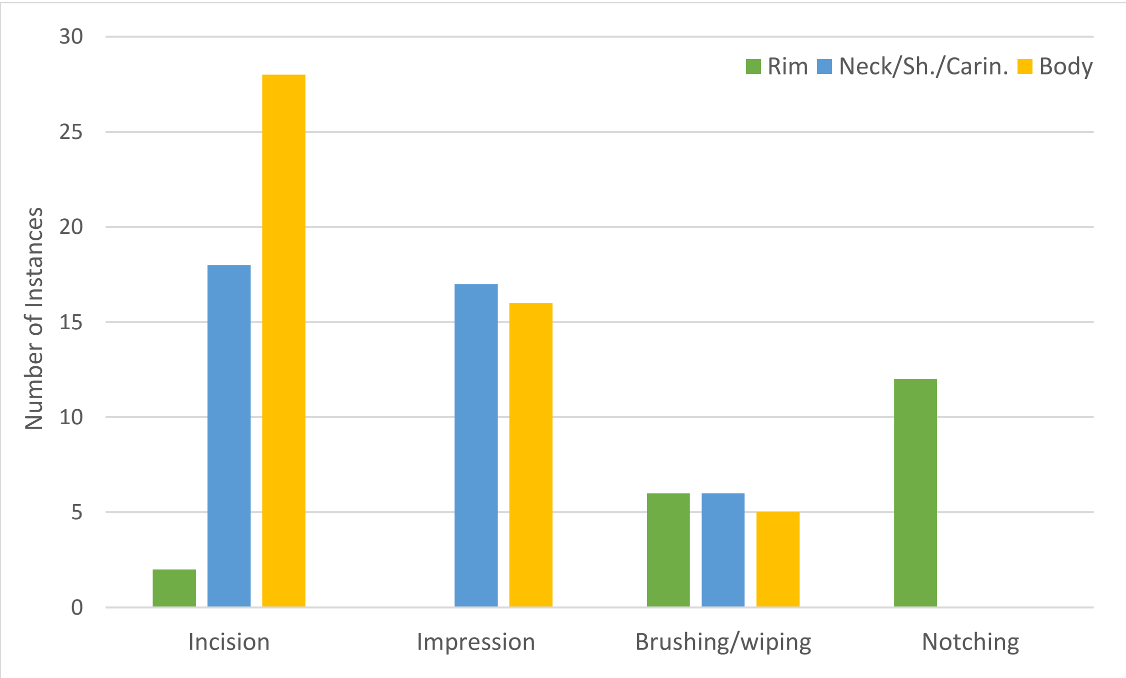


Figure 6.14 Types of decoration identified in Sikopo assemblage and number of instances each type was observed (e.g. Sherd #1 decorated with incision and impression = one instance for incision and one for impression).

The remainder of this section describes the decoration in more detail, with a focus on combinations of techniques and configurations observed on the formal sherds as well as temporal patterns that can be interpreted from the stratigraphic sample.

Rim, Neck, Shoulder and Body Decoration

Decoration of the rims was basic with lip notching, specifically U-shaped notches, being dominant (Table 6.9). The neck, shoulder and carination sherds exhibited more complex decoration. Overall, incision and linear impression were the most commonly combined techniques.

Table 6.9 Decoration combinations of Sikopo formal sherds from the surface, Layer 1b (10-40 cm) and Layer 1c (40-80 cm) (sherds conjoined first then counted only once).

Notched Rims	**Surface**	**Layer 1b**	**Layer 1c**	**Count**
U-shaped	1	3	1	5
U-shaped + incision	-	1	-	1
Wave	-	1	-	1
Outer scoop	-	-	1	1
Outer scoop + thickened lip	-	1	-	1
Inner scoop	-	1	-	1
Uncertain (degraded)	2	4	-	6
Total	*3*	*11*	*2*	*16*
Neck/shoulder sherds				
Incision (chevron)	1	-	-	1
Incision	2	4	-	6
Linear impression	1	-	-	1
Impressed crease	-	1	-	1
Total	*4*	*5*	*-*	*9*
Shoulder/carination sherds				
Incision	4	-	-	4
Incision (chevron)	1	-	-	1
Incision + linear imp.	6	-	1	7
Linear impression	3	1	-	4
Single-tool imp. (rectangular)	1	1	1	3
Total	*15*	*2*	*2*	*19*
Body sherds				
Incision	9	13	4	26
Incision (criss-cross)	1	-	-	1
Incision (chevron) + linear imp.	1	-	-	1
Linear impression	1	3	1	5
Single-tool imp. (rectangular)	3	6	2	11
Total	*15*	*22*	*7*	*44*

The most elaborately decorated sherds possessed bounded incised patterns, predominantly parallel and diagonally running incised and impressed lines as well as chevrons (Figure 6.16: SIK 863). An unbounded criss-cross incised decorative configuration was identified on a body sherd (Figure 6.19: SIK 816). Small, thin rectangular impressions were identified on 14 sherds (e.g. Figure 6.19: SIK 13). These impressions never appeared alongside any other form of decoration. Caution was taken when identifying them because hollows created from insect burrowing were observed on some of the sherds which sometimes resembled these impressions.

Temporal Patterns

Between the first phase (825-700 calBP) and second phase (625-500 calBP) of occupation of Sikopo, which are represented by Layers 1c and 1b, respectively, decorative styles appear to have remained stable with incision and lip notching, and to a lesser extent, impression, being dominant over time. Focusing on the rim data, Table 6.9 illustrates that there were no noticeable temporal patterns in their vertical distribution, apart from the likelihood that a larger number of pots were used and discarded at the site during the second phase compared to the first phase of settlement. For the neck, shoulder, carination and body sherds, Table 6.9 demonstrates in a similar manner that a higher number of these sherds were found to be decorated in Layer 1b than in 1c. Further implications the stratigraphic ceramic evidence may have on reconstructing the nature and development of prehistoric settlement of Sikopo and pottery distribution in the Western Solomons are discussed in Chapter 10.

6.4.2 Vessel Form

Three vessel forms were identified: small incurving/direct jars with gently carinated bodies (Form VI), outcurving pots with globular or sharply carinated bodies (Form IV), and a small open bowl (Form I). Three of five sherds classified as possible base portions were concaved, suggesting rounded bases. The remaining two base sherds, which conjoined and had deep thumb impressions on its inner surface, were more angular and may have formed part of a flat-bottomed vessel (Figure 6.18: SIK 851). The sherds were classified into vessel forms based mainly on rim shape, direction and body shape. Form VI jars and Form IV pots were the most dominant forms (Table 6.10). Only one unrestricted vessel, a small open bowl, was identified in the assemblage.

Table 6.10 MNV of Sikopo vessel forms identified from each vessel portion (sherds conjoined then counted as one).

Portion	**I**	**IV**	**VI**	**Total**
Rim	1	3	10	14
Neck/shoulder	0	10	10	20
Carination	-	3	0	3
Total MNV	*1*	*10*	*10*	*21*

Form VI

At least 10 incurving/direct restricted pots were identified in the assemblage. These vessels were characterised by narrow spout-like mouths and unclearly defined or non-existent necks (Figure 6.15). The shoulders or mid-body were the widest points of this form (see Figure 6.16: SIK 833). All apart from one of the Form VI rims were recovered in excavation. The single surface rim, SIK 755, was also the only plain Form VI rim. The rest were all notched.

Figure 6.15 Sikopo Form VI rim varieties.

Figure 6.16 Sikopo Form VI neck/shoulder sherds.

Form IV

At least 10 outcurving pots were identified. The body shape of this vessel form appeared to be predominantly globular, and the necks of these vessels were more pronounced and curved than Form VI (Figure 6.17).

Three sharp carinations, each belonging to a different vessel, were identified. One of these vessels appeared to be flat-bottomed, based on close similarities observed in sherd colour, fabric and thickness between the largest carination, SIK 842, and the possible base sherd, SIK 851 (Figure 6.18). The shape of the remaining two carinations suggested their vessels were wider than they were tall and were characterised by steep rising shoulders. This body shape suggests the rims were likely to be outcurving or everted. As no everted rims were identified, it is likely to the be the former, thus grouping these pots as Form IV vessels.

Figure 6.17 Sikopo Form IV outcurving rims (top row), neck/shoulder (middle row) and neck portions (bottom row).

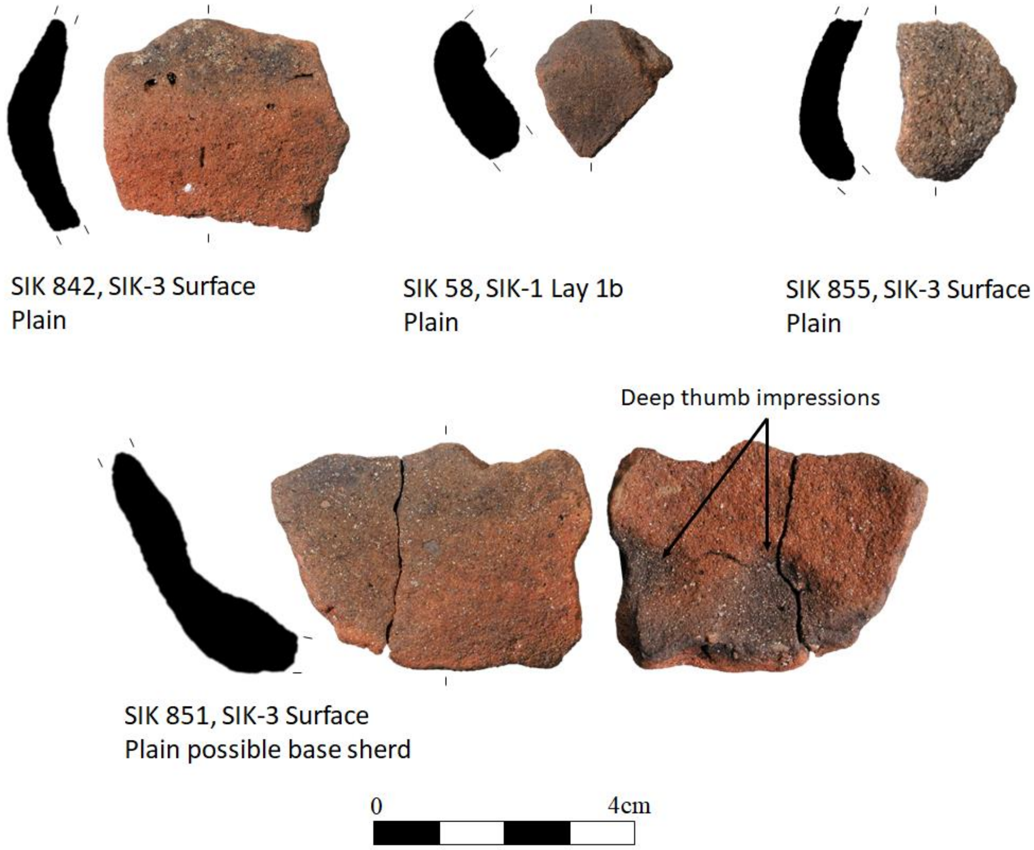


Figure 6.18 Sikopo sharp carinations and possible flat-bottomed base sherd. Sherds SIK 851 and 842 did not conjoin but are likely to be from the same vessel.

Form I

A single notched rim sherd was classified as a Form I open bowl/pot (Figure 6.19: SIK 841). It was one of the smallest vessels in the assemblage, measuring approximately 12-16 cm in diameter, and its rim direction suggests it was shallow and dish-like.

Figure 6.19 Sikopo Form I bowl (top row) and examples of decorated body sherds (bottom row).

6.5 Choiseul Pottery

A total of 2,754 sherds were recovered from sites in Choiseul, and this accounted for approximately 69% of the entire ceramic assemblage analysed as part of this study. The largest pottery assemblages were collected from Nuatambu (NUA-1), WAG-11 and WAG-12 on Wagina, and LAE-6, LAE-4 and LAE-1 on Laena Island (Table 6.11).

Table 6.11 Choiseul pottery sites listing total number of sherds, average sherd area and thickness, number of rims and MNV estimations for each site.

Site	No Sherds	Av. Sherd Area (cm^2)	Thickness (mm)	Rims	MNV
Wagina					
Te rapa (WAG-1)	6	7.1	4.5	-	1
Nikumaroro Garden (WAG-2)	72	6.3	5.3	1	1
Adrian's Lot (Miller 1979)	37	6.4	5.5	2	2
Rockshelter 1 (WAG-10)	1	14.5	10	-	1
Koura's Garden (WAG-11)	525	3.9	4.9	8	7
Eriton Stone (WAG-12)	459	7.6	5.3	10	9
Te non (WAG-13)	13	32.3	4.8	1	1
Sub-total	*1113*	*11.2*	*5.8*	*22*	*22*
Laena Island					
Apuseva Wall Complex (LAE-1)	182	6	5.1	10	10
Apuseva Hilltop (LAE-2)	15	10.7	6.2	-	1
Silas' Plot (LAE-3)	14	8.8	5.6	-	1
Lynald's Plot (LAE-4)	417	6.4	5.3	22	15
Bekere's Plot (LAE-5)	2	8	6	-	1
Raghata Garden (LAE-6)	314	6	5.1	14	13
Sub-total	*944*	*7.7*	*5.6*	*46*	*41*
Nuatambu					
Vava Sisirana (NUA-1)	695	8.1	6.3	27	24
Sao					
Rockshelter (SAO-1)	2	10	6	-	1
TOTAL	**2754**	**9.2**	**5.9**	**95**	**88**

On Wagina, pottery found at the hilltop site, Eriton Stone (WAG-12), was one of the most intact and well-preserved assemblages of the Choiseul assemblages. Moreover, half of the rims found throughout the entire Wagina survey were found at this site. Koura's Garden (WAG-11), a ridgetop surface scatter, produced the next highest number of rims as well as the greatest number of sherds. The low average sherd area for the site, however, demonstrates that this was attributable to a high degree of fragmentation of the sherds caused most likely from hoeing and gardening of the site in the last few generations. On Laena Island, the highest number of rims and MNV totals were calculated for the shrine complexes located at Apuseva (LAE-1) and Lynald's Plot (LAE-4) as well as the large surface scatter of pottery and chert found at Raghata (LAE-6).

As was explained in section 6.1, some of the Choiseul pottery was originally collected by Miller (1979) and was loaned out from SINM. This included most of the pottery from Nuatambu and two plain body sherds which Miller found on the surface of a small rockshelter at Sao, located a kilometre north of Rokoso. Additionally, he collected 37 sherds from a sub-surface ceramic site he named Adrian's Lot, located near the coast between Nikumaroro and Kukutin. The rest of the Nuatambu assemblage, a total of 36 sherds, was donated by Rhys Richards who visited the village in 2008. The remaining sections on decoration and vessel form focus on the largest collections from Wagina, Laena Island and Nuatambu.

6.5.1 Decoration

Comparing the proportion of decorated to undecorated sherds for each of the Choiseul assemblages, the Nuatambu pottery displayed the highest fraction with 30% (N=208) of the assemblage exhibiting decoration. For the Laena Island pottery, 24.2% (N=228) of the sherds were decorated. While for the Wagina assemblage, the total came to 19.7% (N=219). Rims were rarely left undecorated, with only one plain rim identified from Wagina (Figure 6.20).

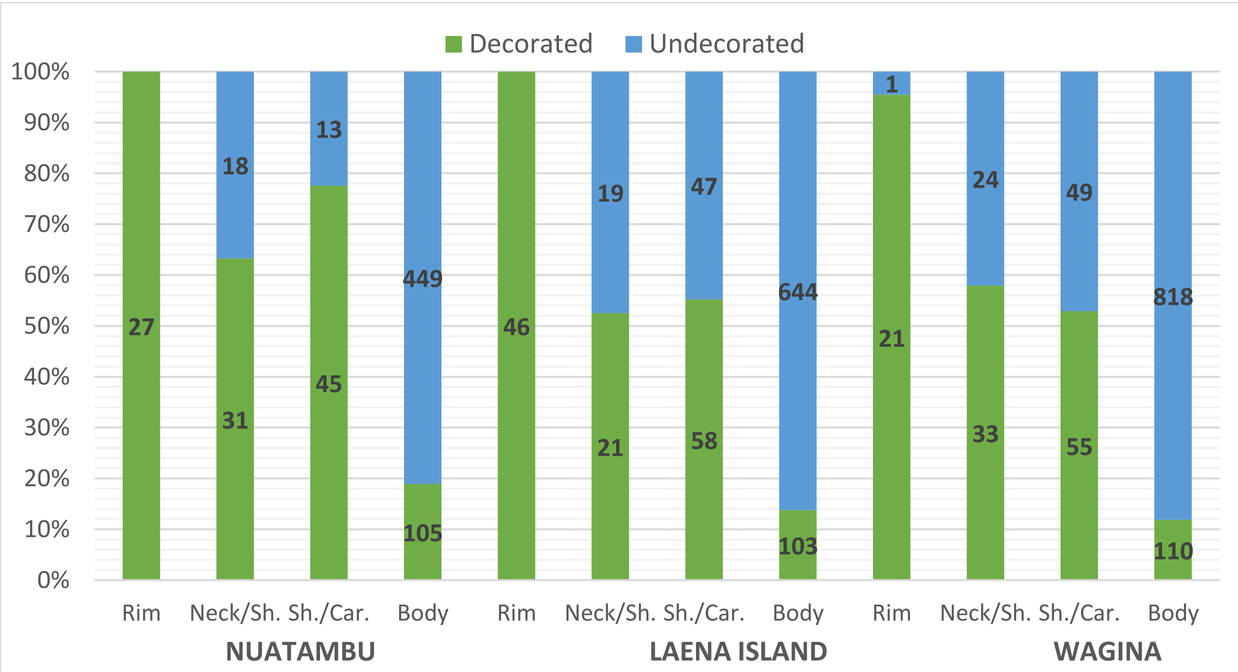


Figure 6.20 Histogram showing proportion of decorated to undecorated sherds for main Choiseul assemblages (bolded numbers represent number of sherds).

Overall, the Choiseul assemblages were relatively homogenous in their surface decoration with incision, impression, lip notching and brushing or wiping appearing dominant (Figure 6.21). Pottery from Nuatambu displayed the highest degree of variation in decoration out of the three assemblages, with a total of seven techniques identified. The most dominant of these were linear incision, single-tool impression, and the brushing or wiping of the vessel exterior which resulted in visible striations or an irregular surface with upraised lines. Three sherds with comb incision and another three with slash incision were identified (Figure 6.35). Six neck/shoulder sherds were decorated with an impressed crease at the base of the neck (Figure 6.33). Plus, a single sherd was perforated (Figure 6.35: NUA 1549).

For the Laena Island and Wagina pottery assemblages, four decorative techniques were identified in addition to notching and minor modifications to the lip. The most dominant were linear incision, single-tool impression, lip notching and brushing/wiping. Only two sherds were decorated with applique, a shoulder portion from Laena Island and a neck/shoulder fragment from Wagina (Figure 6.36: LAE 2028).

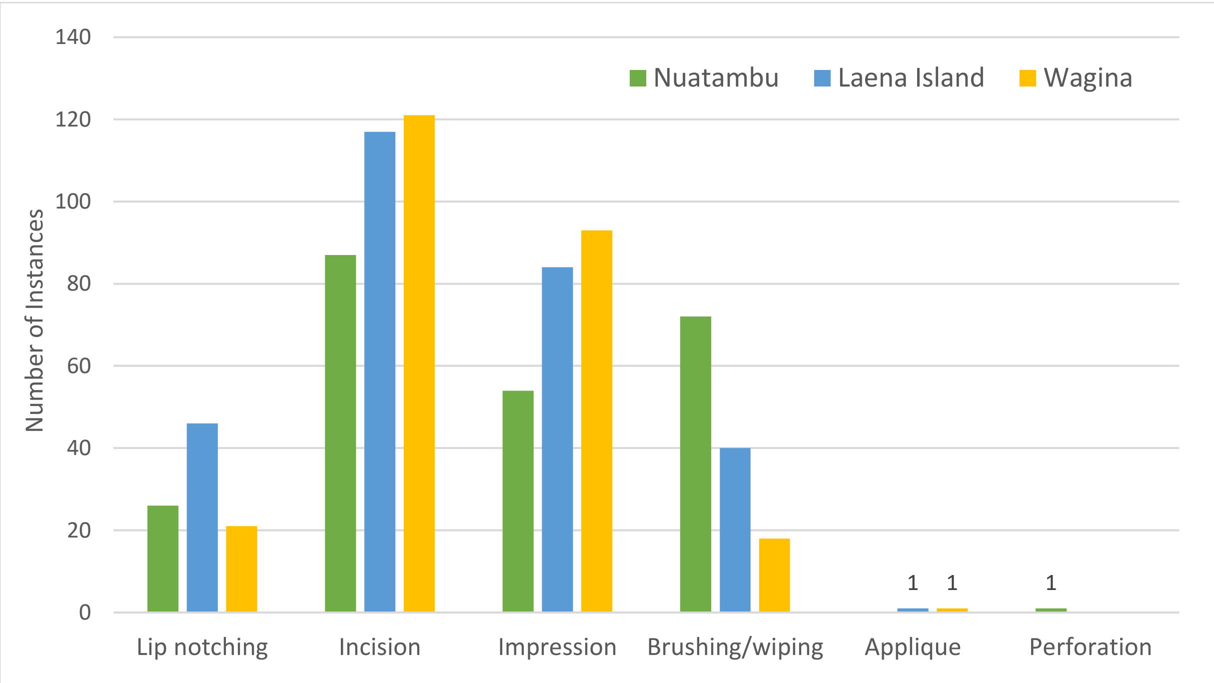


Figure 6.21 Types of decoration identified in main Choiseul assemblages and number of instances each type was observed (e.g. Sherd #1 decorated with incision and impression = one instance for incision and one for impression).

The remaining paragraphs describe the decoration of all three pottery collections in more detail. The excavated assemblage from Nuatambu is described first, to assess evidence of temporal patterns in decorative styles. This is followed by descriptions of combinations of techniques and distinct configurations of bounded incised and impressed patterns observed on the rims and other formal sherds from all three sites.

Temporal Patterns

The small sample size of the excavated assemblage from Nuatambu impedes upon any statistically significant interpretations to be drawn from the data. Despite this, however, some tentative assumptions can be made. The stratigraphic distribution of decorated sherds in the assemblage demonstrate that the three most dominant forms of decoration - linear incision, single-tool impression and lip notching – appeared to be stable over time (Table 6.12). The creation of an impressed crease at the base of the neck and slash incisions appear to have been adopted more recently. While sherds exhibiting evidence of wiping and comb incision appear confined to deeper levels. Brushed or burnished sherds appear to decrease over time from their peak in frequency in Layers G, H and J. There is also evidence for a decrease in vessel size over time. In Layer J, where the largest vessels in the test pit were identified, the average sherd area ranged between 10.1 to 26.5 cm^2 and the sherd thickness between 6.8 to 7.6 mm. While in Layers C and D, the average sherd area measured between 6.1 to 7.6 cm^2 and the sherd thickness was approximately 5.7 mm. It should be taken into account, however, that better preservation of the pottery in the more water-logged lower layers may well have influenced this.

Table 6.12 Stratigraphic distribution of decorated sherds per layer and decoration type from Miller's (1979) test pit (sherds conjoined first then counted only once).

Decoration	**Layer C**	**D**	**E**	**F**	**G**	**H**	**J**	**Total**
Linear incision	8	-	4	-	3	-	8	23
Bounded incised pattern	1	-	-	-	-	-	-	1
Slash incision	2	-	-	-	-	-	-	2
Comb incision	-	-	-	-	1	-	2	3
Single-tool imp.	4	1	1	1	1	-	4	12
Wiping	-	-	-	-	-	1	5	6
Brushing	1	2	6	2	9	10	16	46
Impressed crease	2	-	-	-	-	-	-	2
Lip notching	6	2	1	-	2	1	7	19
Total decor. sherds	49	4	7	2	11	11	65	149
% of total exc. assemblage	9.4	2	4.7	1.2	6.3	4.7	17	44.7
Total plain sherds	47	14	10	4	14	5	47	141
% of total exc. assemblage	18.4	5.5	3.9	1.6	5.5	2	18	55.3

The Nuatambu assemblage exhibited the greatest variety in lip notching amongst the entire Manning Strait assemblage. All but one of the Nuatambu rims were notched, and it was common also for the lips to be gently paddled flat. Eight of the nine notching variations identified in this formal analysis were observed, the most dominant being outer scoop or notching of the outer half of the lip (Table 6.13). A comparison of the stratigraphic distribution of the notched rims indicates that variation in lip notching appeared to increase over time. For example, only two varieties were identified in Layers G, H and J, whereas, seven were observed in Layers C to E.

Table 6.13 Distribution of Nuatambu notched rim varieties from the surface and Miller's (1979) test pit (sherds conjoined first then counted only once).

Notching Type	Surface	Layer C	D	E	G	H	J	Total
Outer scoop	2	2	1	-	2	1	6	14
Inner scoop	-	1	-	-	-	-	-	1
Opposing scoop	-	-	1	-	-	-	-	1
U-shaped	2	1	-	-	-	-	-	3
Wave	-	1	-	-	-	-	-	1
Linear	-	-	-	-	-	-	1	1
Diamond	-	1	-	-	-	-	-	1
Stepped	-	-	-	1	-	-	-	1
Plain	1	-	-	-	-	-	-	1
Total	5	6	2	1	2	1	7	24

Rim Decoration

For the Laena Island and Wagina pottery, lip notching was also dominant. All apart from two of the 46 rims from Laena Island and one of the 22 rims from Wagina were notched. U-shaped notching was the most commonly observed, followed by outer scoop (Table 6.14). No diamond notching was identified and, unsurprisingly, the Laena Island rims, of which there were twice as many as the Wagina collection, exhibited a wider range of notching. Thickening and flattening of the lip was identified on approximately 35% of the Wagina rims and 28% of the Laena Island rims. Lipping, created either through the application of thin strips of clay or the pressing of excess clay to the rim, was identified on the outer lips and a few inner lips from both sites. Incision commonly appeared as straight, thin lines running parallel to the lip just below the lip or along the neck, or running diagonally down the neck/shoulder of the vessel sometimes forming chevrons. Apart from a single unbounded criss-cross incised pattern observed on a Wagina rim (Figure 6.34: WAG 2925), incision of most of the rims from both sites was applied uniformly and with precision.

Table 6.14 Tally of notching varieties observed amongst Laena Island and Wagina rims (sherds conjoined first then counted only once).

Notching Type	Laena Island	Wagina
U-shaped	15	8
U-shaped/outer scoop	1	-
V-shaped	3	1
Outer scoop	7	3
Inner scoop	2	1
Opposing scoop	1	-
Opposing scoop/linear	1	-
Wave	4	-
Wave/outer scoop	-	1
Stepped	3	-
Uncertain (degraded)	1	5
Total	38	19

Neck, Shoulder and Body Decoration

The shoulders of the Nuatambu vessels were typically the most intricately decorated portions. The most complex configurations were carried out either solely using incision or using a combination of incision and single-tool impression. The impressions appeared either as shallow and lenticular in shape or deep and pointed. Intricate examples included a curvilinear incised tongue motif which has been deemed as a possible late Lapita sherd (Figure 6.31: NUA 1542) (Richards 2011), an incised zig-zag motif, and bounded incised patterns that incorporated long curvilinear or straight incisions with consecutive short impressions (Figure 6.35). The last configuration was the most commonly identified in the Nuatambu assemblage and exhibited close resemblance to some incised Middle Period ware documented in the Shortlands (Irwin 1972).

Tables 6.15 and 6.16 list the various combinations of decoration observed on the neck, shoulder, carination and body sherds from Nuatambu, Laena Island and Wagina. Parallel linear incisions enclosing a series of short linear impressions was also the most commonly observed decorative configuration for the Laena Island and Wagina assemblages. As was the case for the Nuatambu pottery, the pattern was typically applied to the shoulder and either with just incision or both incision and single-tool impression.

Table 6.15 Decoration combinations observed on neck and neck/shoulders sherds for Nuatambu, Laena Island and Wagina assemblages (sherds conjoined first then counted only once).

Neck sherds	**Nuatambu**	**Laena Island**	**Wagina**
Impressed crease	3	2	4
Imp. crease + linear impression	1	-	1
Imp. crease + incision	1	-	-
Imp. crease + brushing	1	-	1
Imp. crease + wiping	-	-	2
Linear impression	-	4	1
Linear incision	1	-	5
Bounded inc. (incision + impression)	-	-	2
Total	*7*	*6*	*16*
Neck/shoulder sherds			
Linear impression	2	5	6
Rectangular impression	-	3	3
Linear incision	6	2	1
Bounded incision	1	2	1
Bounded incision (chevrons)	-	-	1
Bounded inc. (incision + impression)	5	1	2
Unbounded incision	-	1	-
Slash incision	2	-	-
Brushing	5	1	-
Possible applique	-	-	1
Total	*21*	*15*	*15*

A few sherds displaying larger fields of decoration exhibited that the incisions were typically made diagonally or sometimes horizontally to the vertical axis of the vessel (e.g. Figure 6.30: WAG 1366; Figure 6.24: LAE 3433). Other bounded incised patterns observed included chevrons, and a single cross-hatch incised pattern identified on a body sherd from Laena Island (Figure 6.36: LAE 1687). Unbounded incision was less commonly observed for both collections, and conventionally appeared as irregularly spaced incisions that criss-crossed with one another.

Table 6.16 Decoration combinations observed on shoulder, carination and body sherds for Nuatambu, Laena Island and Wagina assemblages (sherds conjoined first then counted only once).

Shoulder/carination sherds	**Nuatambu**	**Laena Island**	**Wagina**
Linear impression	4	4	9
Rectangular impression	-	5	4
Deep groove/gouge	-	2	-
Linear incision	7	10	8
Bounded incision	2	6	8
Bounded incision (chevrons)	-	-	3
Bounded incision (zig-zag)	2	-	-
Bounded inc. (incision + impression)	11	23	17
Bounded inc. + possible perforation	1	-	-
Unbounded incision	-	2	-
Slash incision	2	-	-
Comb incision	2	-	-
Wiping	3	-	1
Brushing	9	1	-
Applique (thin strip)	-	1	-
Total	*43*	*54*	*50*
Body sherds			
Linear impression	12	8	21
Rectangular impression	6	5	6
Rectangular imp. + linear incision	1	2	1
Linear incision	26	35	39
Bounded incision	2	9	12
Bounded incision (chevrons)	2	2	1
Bounded incision (cross-hatch)	1	1	-
Bounded inc. (incision + impression)	4	4	6
Unbounded incision	-	-	6
Comb incision	1	-	-
Wiping	6	4	2
Brushing	40	24	10
Possible punctation	1	-	-
Total	*102*	*94*	*104*

6.5.2 Vessel Form

Five vessel forms were identified: inward/direct restricted jars (Form VI), everted pots and a single inverted pot (Form V), outcurving pots (Form IV), sharply carinated pots and open bowl/pots (Forms I and II). A total of eight sherds were classified as bases, five from Nuatambu, two from Laena Island and one from Wagina. All were rounded, including a large, intact portion found on Laena Island (Figure 6.32), and no flat-bottomed vessels were positively identified. Classification of the formal sherds into vessel forms was based principally on the direction and shape of the rim and neck, as well as body shape.

The most dominant form for the Nuatambu assemblage were Form VI jars, followed by Form V pots and then Form IV pots (Table 6.17). Only two open bowl/pots with vertical rim and wall orientations (Form II) were identified in the assemblage.

Table 6.17 MNV of Nuatambu vessel forms identified from each vessel portion (sherds conjoined then counted as one).

Portion	II	IV	V	VI	Total
Rim	2	8	0	11	21
Neck/shoulder	0	0	10	33	43
Carination	-	6	0	2	8
Total MNV	*2*	*8*	*10*	*33*	*53*

The most dominant form for the Laena Island and Wagina assemblages were Form IV pots (Tables 6.18 and 6.19). This was followed by Form VI vessels for the Laena Island assemblage. No Form V vessels were identified from this collection, and a total of nine open bowl/pots were counted, the highest among the Choiseul assemblages. The second most abundant vessel form for the Wagina assemblage were Form V globular pots, followed by Form VI jars. Only three Form II bowl/pots were identified in this assemblage.

Table 6.18 MNV of Laena Island vessel forms identified from each vessel portion (sherds conjoined then counted as one).

Portion	I	II	IV	VI	Total
Rim	6	3	21	5	35
Neck/shoulder	I	0	24	9	33
Carination	-	-	15	0	2
Total MNV	*6*	*3*	*24*	*9*	*42*

Table 6.19 MNV of Wagina vessel forms identified from each vessel portion (sherds conjoined then counted as one).

Portion	II	IV	V	VI	Total
Rim	3	13	0	4	20
Neck/shoulder	0	14	8	5	27
Carination	-	11	0	1	2
Total MNV	*3*	*14*	*8*	*4*	*29*

Form VI

At least 33 inward/direct restricted jars were identified in the Nuatambu assemblage. For the Laena Island and Wagina assemblages, a total of nine inward/direct restricted jars and four of these vessels were identified, respectively.

In similar fashion to the Form VI vessels identified in the Arnavon Islands assemblage, these vessels were characterised by inward oriented spout-like mouths, an undefined neck, and narrow, gently shouldered bodies (Figures 6.22-6.25). The widest points of the vessels were typically the shoulder or mid-body (e.g. Figure 6.23: NUA 1139).

No sub-forms or distinct variations in the Form VI vessels were discernible between the main Choiseul sites. Except, however, for remnants of a slightly incurving and thin-walled pot found in a rock crevice near a human burial shrine (WAG-13) on Wagina (Figure 6.26). This vessel closely resembled pots made historically and up until the mid-twentieth century in northwest Choiseul which were used for cooking as well as ceremoniously for internment or to store shell ornaments (Ratliff 1979; USP 1979; Craven 1976). Apart from notching, there was no decoration associated with this vessel except for a peculiar human-like figurine, with a head missing, which appears to have been etched after the pot was fired.

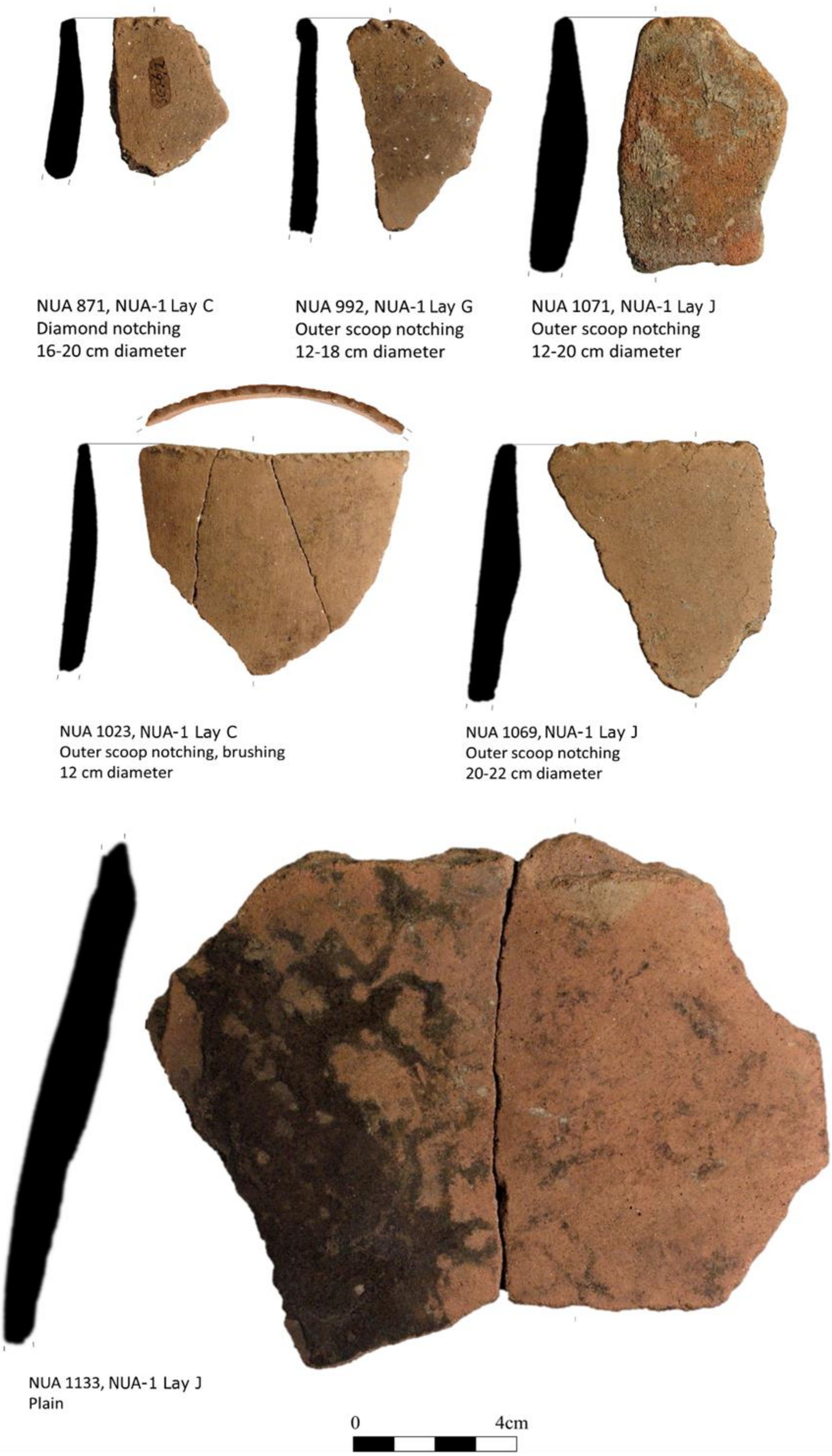


Figure 6.22 Nuatambu excavated Form VI rim varieties and largest vessel recovered in the test pit (bottom row).

Figure 6.23 Nuatambu Form VI rim varieties (ctd.).

LAE 3574, LAE-4 Surface
Outer scoop notching,
brushing
14-18 cm diameter

LAE 1698, LAE-4 Surface
Outer scoop notching
30-36 cm diameter

LAE 2035, LAE-6 Surface
Stepped notching
16-20 cm diameter

LAE 3576, LAE-4 Surface
Outer scoop notching

LAE 3420, LAE-4 Surface
Bounded incision

LAE 3433, LAE-4 Surface
Bounded incision (incision + impression)

Figure 6.24 Laena Island Form VI rim and neck/shoulder sherds.

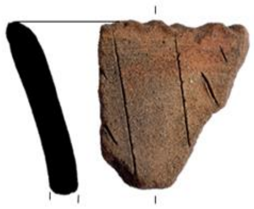
Figure 6.25 Wagina Form VI rim and neck/shoulder sherds.

Figure 6.26 Wagina Form VI historic sub-form resembling northwest Choiseul twentieth century cooking pot from SINM Ethnographic Collection (top right).

Form IV

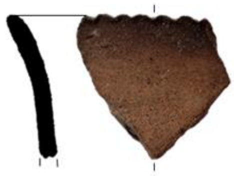
The Laena Island assemblage possessed the largest number of outcurving pots, with at least 24 vessels identified. For the Wagina assemblage, at least 14 of these vessels were counted, while only eight were identified from the Nuatambu collection. The Laena Island assemblage demonstrated the highest amount of variation in the shape and decoration of the lip and rim. The most conventional varieties possessed rounded or pointed lips, no extra lip modification and the rims flared out quite noticeably (Figure 6.28). While others were sometimes less curved, possessed thickened inner and/or outer lips and were decorated with an impressed crease below the rim (Figure 6.27). This variation was also observed in the Wagina assemblage (Figures 6.29 & 6.30). The Nuatambu outcurving pots, conversely, were more homogenous and exhibited little variation in lip modification apart from notching (Figure 6.31). In the few instances where there was some indication of lower body shape, the vessels predominantly appeared gently carinated or globular (e.g. Figure 6.31: NUA 984). This contrasted with the slimmer and more cylindrical shape of the Form VI vessels. In addition, the outcurving pots appeared more likely than the Form VI vessels to possess sharp carinations.

Figure 6.27 Laena Island Form IV less common rim varieties (upper two rows) and neck/shoulder sherds.



LAE 3412, LAE-4 Surface
Wave notching, bounded incision
20-26 cm diameter

LAE 3668, LAE-4 Surface
U-shaped notching, linear incision
14 -20 cm diameter



LAE 3725, LAE-4 Test Pit 1, Lay 2
V-shaped notching
14-20 cm diameter

LAE 4009, LAE-4 Test Pit 3, Lay 3
V-shaped notching, brushing
16-20 cm diameter

LAE 3455, LAE-4 Surface
Outer scoop notching, linear incision
20-24 cm diameter

LAE 3637, LAE-4 Surface
Wave notching
20-28 cm diameter

Figure 6.28 Laena Island Form IV conventional rim varieties.

Figure 6.29 Wagina Form IV conventional rim variety (top row), less common rim varieties (middle two rows) and neck sherds (bottom row) recovered from Koura's Garden (WAG-11) and Eriton Stone (WAG-12).

Figure 6.30 Wagina Form IV conventional rim variety (top row), less common rim varieties (middle row) and neck/shoulder sherds recovered from Eriton Stone (WAG-12) and Adrian's Lot (WAG-3).

Figure 6.31 Nuatambu Form IV rims and neck/shoulder sherds.

A total of 32 sharp carinations were identified from the Choiseul pottery (Figure 6.32). These included six sherds from Nuatambu, 15 from Laena Island and 11 from Wagina. As was the case for the Arnavon Islands pottery, these vessels were characterised by steep rising shoulders and were likely to be as equally wide as they were tall. The rim form associated with these carinations was not able to be absolutely determined. It is likely, however, at least for the Laena Island assemblage which possessed no everted rims, that these vessels were outcurving and would thus qualify as Form IV vessels.

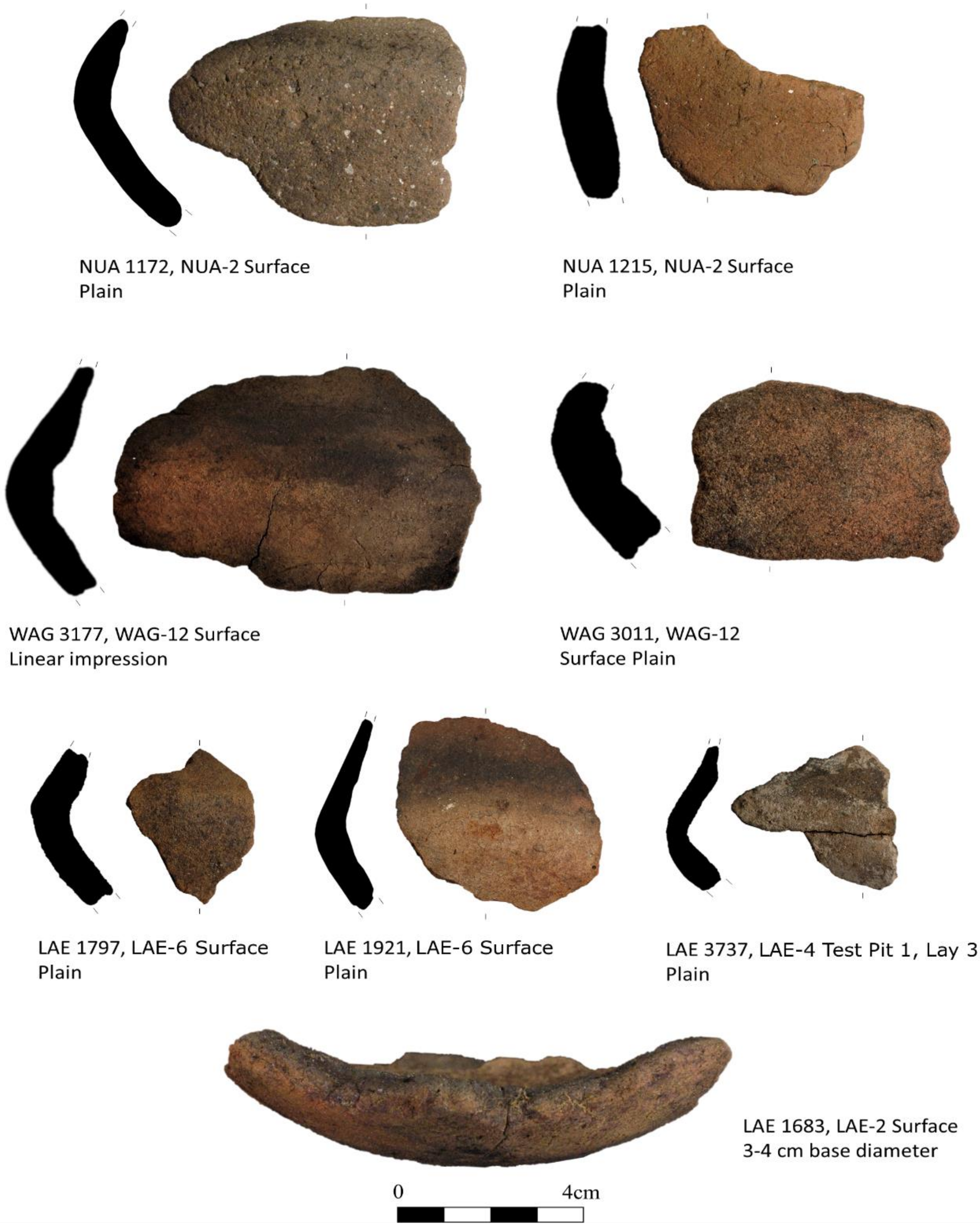


Figure 6.32 Sharp carinations from Nuatambu (top row) and Wagina (middle row), and sharp carinations and a rounded base sherd from Laena Island (bottom two rows).

Form V

A total of 15 everted and three inverted vessels were identified from the Choiseul pottery. These included eight everted and two inverted (NUA 1044 & 1549) pots from Nuatambu and seven everted and one inverted (WAG 3107) pot from Wagina (Figure 6.33). These vessels were typically globular in shape, although some appeared narrower bodied, and often possessed an impressed crease created at the base of the neck. Some of these subtle impressed creases were formed deliberately to decorate and accentuate the curvature of the neck of the pot (e.g. NUA 1537). While others, it appears, were created unintentionally in the process of the potter moulding the neck.

Figure 6.33 Form V vessels identified from Nuatambu (top two rows) and Wagina (bottom two rows).

Forms I & II

A total of 14 open bowl/pots were identified: two from Nuatambu, nine from Laena Island and three from Wagina (Figure 6.34). Six of the Laena Island vessels possessed an outward rim/wall orientation and are likely to have appeared shallow and bowl-like (Form I). While the remainder possessed more vertical rim and vessel walls, characteristic of deeper, open pots (Form II). The Laena Island and Wagina vessels were typically decorated with thickened outer lips and incised patterns running diagonally to the central vessel axis. One of the Wagina vessels was decorated with unbounded incision (WAG 2925).

Figure 6.34 Form II vessels from Wagina and Nuatambu(first row), and Form II (second row) and Form II vessels (third & fourth rows) from Laena Island.

Figure 6.35 Miscellaneous decorated body sherds from Nuatambu showing array of decorative techniques and configurations.

Figure 6.36 Miscellaneous decorated body sherds from Laena Island showing array of decorative techniques and configurations.

Figure 6.37 Miscellaneous decorated body sherds from Wagina showing array of decorative techniques and configurations.

6.6 Summary of Stylistic Evidence and Conclusions

This chapter has explained the methodological procedure used in the formal analysis of pottery collected from Manning Strait and summarised stylistic findings for each of the three main regions under examination: Isabel, Arnavon Islands and Choiseul. For each region, an overview was given of the provenance, surface or stratigraphic distribution and condition of the ceramic assemblages. This was followed by descriptions of variation observed in surface decoration applied to the pottery and in the shape of the vessels. In the rest of this summary, key findings will be raised from a comparison of the types of decoration and vessel forms observed in the assemblages and brief comparisons will be made with other pottery styles documented in the Western and Northern Solomons.

A few overarching patterns are made clear when comparing decoration and vessel forms of the Manning Strait assemblages. First, fingernail impression and fingertip impression or pinching, were demonstrated to be the most dominant types of decoration observed for the Isabel ceramics. Whereas, incision and single-tool impression, typically in combination with one another, were the dominant types for the Arnavons and Choiseul assemblages. Second, Form IV vessels dominated the Papatura assemblage while Form VI vessels were the most common vessel form for the Nuatambu and Arnavons assemblages. Form IV vessels were also the most dominant vessel form for the Laena Island and Wagina assemblages. However, unlike the Papatura assemblage which possessed no Form VI vessels, a proportion of the Laena Island and Wagina vessels were made up of Form VI. Small unrestricted bowls and pots were typically the least common vessel form for all the assemblages. It was characteristic for the Laena Island and Wagina assemblages that the inner and outer lips of these vessels were thickened.

There was clear evidence for red slip on some of the Papatura assemblage whereas there was little to none detected for the other assemblages. Judging evidence of differences in the use of slip between all the assemblages was made difficult due to lack of preservation. It is worth nothing, however, that one of the best preserved and well-fired assemblages, pottery buried in clay and sand deposits on Nuatambu, exhibited virtually no evidence of slip. While on the other hand, the Papatura assemblage, which was the most degraded assemblage, demonstrated clear examples of sherds with red slip. Thin striations created from burnishing, instead, were commonly observed on the Arnavons and Choiseul assemblages. Therefore, it may be interpreted from this that red slip was applied on pottery by intertidal communities in the Manning Strait region in the late Lapita period and this diminished leading up to the production of incised and impressed wares in the last millennium.

Comparing the stylistic findings with pottery assemblages from the wider Western and Northern Solomons, four main points can be highlighted. First, the Arnavons and Choiseul assemblages displayed similarities with linear incised and single-tool impressed ceramics Irwin (1972) reported from the Middle Period in the Shortland Islands. Furthermore, there were close parallels in vessel form between these assemblages, namely between the shape and appearance of the Form VI jars and some of the Form IV pots.

Second, comb incision appears to have been confined to pottery made in the Northern Solomons and possibly to within the last millennium. For example, comb incised or heavily brushed sherds from Nuatambu (Figure 6.35: NUA 1110 & 1072) and the Shortlands (Irwin 1972: Plate 44) bear some resemblance to Mararing comb incised pottery from Buka dated to between 800-300 BP (Specht 1969). The sharing of this stylistic trait between these ceramic traditions and the timing suggest that trade and social networks documented ethnographically in the vicinity of Buka and in Bougainville Strait are likely to have developed from around 800 BP.

Third, the Papatura and Kusira assemblages exhibited very close affinities with other intertidal late Lapita pottery recorded in the New Georgia group (Felgate 2003, 2007). This was demonstrated by similar or, in some cases, almost identical decorative patterns such as bands of opposing fingernail impression and rim crenulation, and in the dominance of Form IV pots. Fourth, when comparing late Lapita intertidal assemblages such as Papatura with the Arnavons and Laena Island assemblages which date to within the last millennium, there is evidence of stylistic change over time. Specifically, there is a trend for the abandonment of fingernail impression and crenulated rims and the domination instead of single-tool impression and incision. In addition, there is a rise in popularity of Form VI vessels.

Examining change over time in pottery decoration and vessel shape was limited by the Manning Strait assemblages lacking in sizeable stratigraphic samples. Some patterns are made clear, however, when the findings are compared with other known prehistoric ceramic production and distribution patterns. This will be expanded upon in the following chapter which examines compositional findings and exchange patterns of the Manning Strait pottery, and, ultimately, in more detail in Chapter 10.

Chapter 7 Ceramics II: Compositional Evidence

This chapter describes the methodological procedure and presents findings from a compositional analysis carried out on pottery collected in Manning Strait. It is divided into six sections. The first describes the methodology which involved an initial assessment of the fillers used in the manufacture of the pottery. This was undertaken using macroscopic fabric analysis, followed by the use of a scanning electron microscope (SEM) and statistical analyses to assess compositional groupings of the pottery. The second section summarises findings from geochemical analyses carried out on clay and sand samples collected in Manning Strait. The third, fourth and fifth sections present the compositional results for pottery from Isabel, Arnavon Islands and Choiseul, respectively. Each section is similarly structured, beginning with a brief introduction which explains the provenance of the samples followed by results of the macroscopic fabric analysis, SEM and statistical analyses. Higher resolution images of the fabric groups illustrated in these sections are given in Appendix C. The final section summarises key findings from the compositional analysis pertaining to prehistoric pottery production centres and distribution patterns, and evidence of these altering over time. This brief discussion is expanded upon and compared with evidence from wider Island Melanesia in Chapter 10.

7.1 Methodology

Following similar analytical and classificatory procedures previously carried out in largescale compositional analyses of prehistoric ceramics in the Pacific (Summerhayes 2000; Wu 2016; Gaffney 2016), the compositional analysis involved three main stages. The first entailed an assessment of the compositional variation and preliminary classification of the pottery using a low-powered microscope. The second involved selecting samples to be analysed using the SEM that took into account the preliminary fabric classification and other factors which were considered important to geochemically characterising the pottery to geological locales and testing evidence of change over time. Geochemical analysis using the SEM involved examining both the additives and clay used in the making of the pottery. Finally, the third stage involved statistical testing of the geochemical clay data to form an understanding of pottery production centres and distribution patterns. Each of these steps is described in more detail below.

7.1.1 Macroscopic Fabric Analysis

An Olympus Microscope was used to examine the mineral inclusions of all formal sherds before samples were to be selected and analysed using the SEM. This process involved examining the outer and inner surfaces as well as the cross sections of each sherd under 40x magnification. All diagnostic sherds were macroscopically analysed and grouped into either one of five preliminary fabric groups (Table 7.1). These groups were formulated initially using Dickinson (2006) and previous largescale macroscopic fabric analyses (Summerhayes 2000; Wu 2016; Gaffney 2016) as a guide, then adjusted once the variation of the entire assemblage had been examined.

Table 7.1 Macroscopic fabric groups identified from Manning Strait pottery.

Fabric Group	Main Inclusions	Minor Inclusions
Ferromagnesian (Fmg)	Fe oxide/pyx./amp.	Quartz/feldsp., shell/coral, lithic
Fmg/Light	Fe oxide/pyx./amp., quartz/feld.	Shell/coral, lithic
Fmg Hybrid	Fe oxide/pyx./amp.	Large (1-5 mm) white incls., quartz/feld.
Light	Quartz/feldspars	Fe oxide/pyx./amp., shell/coral
Calcareous (CA)	Shell/coral	Fe oxide/pyx./amp., quartz/feld., lithic

Sherds were allocated into fabric groups based on a visual estimate of the most abundant types of mineral grains – the 'main inclusions' - and those that appeared but not as frequently – the 'minor inclusions'. Differentiating between these fabrics was done superficially on the appearance of the colour, size and shape of the inclusions. Mineral shape was recorded as either 'rounded', 'angular' or 'sub-angular', and mineral distribution was also recorded as either 'poor', 'fair' or 'well-sorted' (using Orton & Hughes 2013). In addition, clay colour was noted using Munsell colour coding and the feel or texture of the sherds were recorded as either 'smooth', 'rough' or 'harsh'.

The macroscopic fabric analysis served only as a general appraisal of the range in variation in fillers used in the manufacture of the pottery. Although being a rudimentary process compared to more reliable forms of mineral identification such as petrographic analysis, this more time-efficient method and the development of preliminary fabric groups served as a valuable first step before carrying out further geochemical testing.

7.1.2 Geochemical characterisation

Geochemical analyses of pottery have been carried out by archaeologists and ceramic technologists to compliment formal and stylistic analyses for decades (Shepard 1980;

Arnold 1985; Rice 1982; Rye 1981; Summerhayes 2001). The practice has markedly improved our ability to determine the provenance of artefacts and investigate questions regarding the production and distribution of artefacts as well as patterns of transformation over time. In Oceania, some of the first geochemical studies arose alongside pioneering petrographic temper analyses carried out by the late William Dickinson (1998; Dickinson & Shutler 1979) and rising interests in compositional analyses of obsidian and Lapita pottery (Ambrose 1992, 1993; Bird *et al*. 1981; Hunt 1989; Summerhayes 1987; Lilley 1987; Anson 1986; Summerhayes 2000). Over the years, continuous advancements of analytical instruments plus their increasing accessibility and cheaper operational costs have fostered a research environment where it is unusual for any archaeological study of ceramics to not incorporate some archaeometric aspect.

A wide range of techniques are available to geochemically analyse pottery. Some of the most commonly used in the Pacific have been laser ablation inductively coupled mass spectrometry (LA-ICP-MS) (e.g. Cochrane & Neff 2006; Eckert & James 2011; Kennett *et al*. 2004; Leclerc 2016; Shaw *et al*. 2016), instrumental neutron activation analysis (INAA) (Bentley 2000; Descantes *et al*. 2001, 2004), electron microprobe (SEM) (Summerhayes 2000; Rutherford *et al*. 2012; Wu 2016; Gaffney 2016), and portable X-ray fluorescence (pXRF) (Chiu 2003; Burley & Dickinson 2010). Every technique has its strengths and weaknesses (see Price & Burton 2011), however, a strong advantage of the SEM is that it enables clay and mineral inclusions to be analysed as two separate but complimentary datasets (Summerhayes 2016: 533). This is in contrast to other analytical methods such as XRF, LA-ICP-MS and NAA which cannot differentiate as clearly between clay and mineral inclusions. An additional advantage of the SEM is its high-powered magnification provides a visual avenue that can assist in determining what fillers were selected and how they may have been prepared (e.g. Ownby *et al*. 2004). The remaining sections describe the sampling strategy, plug preparation and procedure of pottery analysis using the SEM.

Sampling strategy

A total of 96 sherds were selected for geochemical analysis, sampled from seven ceramic-bearing archaeological sites in Manning Strait (Table 7.2). As this represented only a very small proportion of the total Manning Strait assemblage, a selective sampling process was chosen. This guaranteed a wide range of variation in fabrics and vessel forms to be accounted for which may be missed in random sampling. The sherds were selected based on a hierarchical set of criteria that placed emphasis on targeting individual vessels, encompassing variation in fabric and decoration, and testing temporal and spatial patterns of pottery production and distribution. The criteria were, in decreasing order of inclusiveness, site, provenance (i.e. excavated or surface), vessel portion, vessel shape, fabric, decoration type and sherd colour.

Table 7.2 Total number of sherds selected for geochemical analysis from Manning Strait sites.

Site	Rims	Neck/sh./body	Total No Samples	% of assemblage	% of rim MNV
Papatura	12	3	15	3.5%	40.0%
Kusira	-	4	4	100.0%	N/A
Sikopo	8	10	18	2.1%	57.1%
Wagina	13	5	18	1.7%	68.4%
Sao	-	2	2	100.0%	N/A
Nuatambu	9	12	21	3.0%	45%
Laena Island	14	4	18	1.9%	41.2%
Total	**56**	**40**	**96**	**2.4%**	**47.9%**

Rims were the preferred vessel portion to be selected and effort was made to ensure no two sherds from the same vessel were selected. To account for as much variability as possible in the temper and clay used in the making of the pottery from each site, examples of each fabric type and distinct sherd colours were selected. Diagnostic sherds which were assignable to a vessel form were preferred, however, this was not compulsory. A few final factors considered in the selection process were sherd size and fragility. These were important in determining whether or not a sherd was durable and large enough to withstand being cut and formed into a plug.

The five large assemblages – Nuatambu, Sikopo, Laena Island, Wagina and Papatura - were sampled relatively equally to enable a comparable examination of the geochemical variability between the sites. For the two smaller assemblages, Kusira and Sao, all sherds were sampled to make comparisons against the larger bodies of geochemical data. Overall, the largest sample was taken from the Nuatambu assemblage which demonstrated the widest range in fabric type and decoration among the seven sites. A total of 21 sherds were selected from the site, of which 13 were selected from varying depths in Miller's 1 m^2 test pit and the remainder from the surface of Vava Sisirana (NUA-1) (Table 7.3). One of these samples included the only pottery disc identified in the Manning Strait assemblage, which was recovered in Layer J.

Table 7.3 Provenance and vessel forms of SEM samples selected from Nuatambu.

Context	Forms I/II	Form V	Form VI	Unassigned	Count
Layer C	1	-	1	1	3
D	-	-	1	-	1
G	1	-	-	-	1
H	-	-	1	-	1
J	-	-	5	2	7
Surface	-	1	5	2	8
Total	**2**	**1**	**13**	**5**	**21**

Sikopo, Laena Island and Wagina were evenly sampled with 18 sherds each. For the Sikopo sample, 10 sherds were selected from the 3 m^2 excavation carried out at Area A (SIK-1) and seven from the surface of the site (Table 7.4). One sherd found on Shrine F33 (SIK-3) was also included.

Table 7.4 Provenance and vessel forms of SEM samples selected from Sikopo.

Context	Forms I/II	Form IV	Form V	Form VI	Unassigned	Total
Layer 1a	-	-	-	1	-	1
1b (625-500 calBP)	-	2	-	1	2	5
1c (825-700 calBP)	-	-	-	-	4	4
Surface	1	1	2	2	2	8
Total	**1**	**3**	**2**	**4**	**8**	**18**

For Laena Island, samples were selected from the three largest pottery scatters on the island: Raghata (LAE-6) (N=2), Apuseva (LAE-1) (N=4) and Lynald's Plot (LAE-4) (N=12). Three of the 18 sherds were selected from dated stratigraphic layers at Lynald's Plot and Apuseva, and the remainder were surface finds (Table 7.5). Similarly for Wagina, most of the samples were chosen from the more considerably sized pottery scatters on the island: Eriton Stone (WAG-12) (N=10), Koura's Garden (WAG-11) (N=5), Nikumaroro Garden (WAG-2) (N=1) and Miller's (1979) site, Adrian's Plot (N=2) (Table 7.6). The only excavated sherd from Wagina was a rim sherd recovered by Miller in the upper 3 cm of a shallow sub-surface layer of pottery at Adrian's Plot.

Table 7.5 Provenance and vessel forms of SEM samples selected from Laena Island and Wagina.

Laena Island

Context	Forms I/II	Form IV	Form VI	Unassigned	Count
Layer 1 (300-0 calBP)	1	-	-	-	1
3 (650-550 calBP)	-	2	-	-	2
Surface	3	5	4	3	15
Total	**4**	**7**	**4**	**3**	**18**

Wagina

Context	Forms I/II	Form IV	Form VI	Unassigned	Count
Layer 1	-	1	-	-	1
Surface	2	7	4	4	17
Total	**2**	**8**	**4**	**4**	**18**

For the last large assemblage, Papatura (PAP-1), a smaller sample of 15 sherds were selected as almost the whole assemblage was homogenously tempered with marine beach sands (Table 7.6). The only four sherds identified in the macroscopic fabric analysis of the Papatura assemblage to possess Fmg and Light inclusions were included as samples.

Table 7.6 Vessel forms of SEM samples selected from surface of Papatura, Kusira and Sao.

Site	Forms I/II	Form III	Form IV	Form V	Unassigned	Count
Papatura	4	1	7	2	1	15
Kusira	-	-	1	-	3	4
Sao	-	-	-	-	2	2
Total	**4**	**1**	**8**	**2**	**6**	**21**

Plug preparation

Preparing plugs to be analysed under the SEM involved six steps: 1) cutting, 2) impregnating fragile sherds with Epoxy, 3) moulding the plugs, 4) sanding, 5) polishing and 6) carbon coating. Before beginning the marginally destructive process, each of the selected sherds was comprehensively photographed and recorded.

Stage 1: Cutting was carried out using an eight-inch diamond-edge circular saw, and only a small, approximately one centimetre slice was removed. The size of the sherd slice was adjusted so that three slices were able to fit comfortably within each plug. After cutting, the slices were dried for at least 24 hours in a 40°C oven. In total, 33 plugs were made; 32 to hold the 96 sherds and a test plug which contained off-cuts and was moulded first before proceeding to making the final batches.

Stage 2: Fragile sherds which were determined likely to degrade or become pitted when sanded were impregnated with Epoxy after being cut. Hillquist Thin-section Epoxy was used with a four to one ratio of Part C to Part D Epoxy. Impregnating the fragile sherds involved placing them on tinfoil on top of a stone plate heated to 60°C and then carefully dripping the Epoxy and coating each slice. Due to the porosity of some of the sherds, several coats were applied. After approximately an hour on the hot plate, the slices were left overnight to harden in room temperature. Once thoroughly dried, excess Epoxy was cut from each slice and then the slice was wet sanded with 400 grit sandpaper to expose a flat surface of the sherd. They were then dried again overnight in a 40°C oven.

Stage 3: Moulding the plugs involved laying strips of double-sided tape onto a clean, one centimetre-thick pane of glass. The pane was large enough to fit approximately 15-20 brass rings, and the strips of tape were made long enough to hang over the edge of the glass to assist in the separation of the plugs from the glass. The pottery slices were then placed with the sanded surface face-down onto the tape, with three slices assigned to one brass ring. Labels were placed and then an Epoxy mix was poured into and filled to the top of the brass rings. Nuplex Lockfast K36 resin and hardener were used at a two to one ratio. Finally, the plugs were placed in a 40°C oven for two hours and then left in room temperature overnight. Once the Epoxy had sufficiently set, the brass rings were removed from the pane and the plugs ejected using a mechanical iron punch.

Stage 4: Wet sanding was carried out on the impregnated sherds and shooting surfaces of the plugs incrementally using Europe System sandpaper. This was executed using 400 grit sandpaper followed by 600, 800, 1200 and lastly 2000 grit. To avoid possible contamination between the samples, a fresh piece of sandpaper was used for each plug. Each plug was sanded for approximately 30 seconds at each sandpaper interval, with the purpose of gradually smoothening the plug surface and grinding down the overlying Epoxy layer to approximately 30 μm. Near the end of the sanding process, each plug was examined beneath a reflective microscope to assess the thickness of the overlying Epoxy.

Stage 5: Once sanded, the plugs were polished using a Kent 3 Bench Top Polishing Machine in three stages. One at 6 μm, 3 μm and 1 μm, and for 10 minutes per stage.

Polycrystalline Diamond Surface solutions (6, 3 and 1 μm) were applied onto the polishing mat before each stage, and distilled water was sporadically sprayed onto the polishing mat to keep the mat from drying and to prevent the plugs scratching. To speed this process, a specially designed plug holder had been fabricated to hold and polish three plugs at one time. Once polished, the plugs were examined beneath a reflective microscope to assess if enough overlying Epoxy had been removed. If satisfactory, they were then cleaned in an ultrasonic bath for five minutes.

Stage 6: Carbon coating was carried out at the Centre for Electron Microscopy, University of Otago, using a K575X Peltier-cooled High Resolution Sputter Coater and Emitech 250x Carbon Attachment. The machine creates a thin (10 μm) conductive layer over the plug which enables an electrical path to ground. Carbon coating was selected as it has a minimal impact on x-ray intensities and possesses a low atomic weight (Summerhayes 2000: 38). It also prevents sample 'charging' which can produce an overexposed image. The appropriate settings under which the SEM was set is described in the next section.

SEM analysis

Geochemical analysis of the inclusions and ceramic matrices of the pottery and pedological samples was carried out using a Hitachi Model TM3030 Tabletop Microscope in the School of Archaeology at the University of Otago. Attached to the electron microscope, hitherto referred to as a scanning electron microscope (SEM), was a Bruker Scanning Control Unit (SCU) and Bruker Xflash Energy Dispersive X-ray Spectrometer (EDS). The software package used was ESPRIT Compact. When analysing a sample using the SEM, the specimen is irradiated with a narrow-focused electron beam accelerated to 15kV. Backscattered electrons detected by the microscope are then magnified and displayed on screen in high-resolution imagery. A working distance of 8 mm was used to provide optimal quality imagery. The images created, called electron micrographs or backscatter electron images, exhibit contrasts between areas of the sample with different surface topographies and elemental compositions. Producing accurate measurements from the x-ray energy requires the sample to be set exactly 90° to the beam. Therefore, care was taken in ensuring all samples were polished flat to mitigate any surface irregularities. More detail regarding SEM and EDS functions are given by Froh (2004) and Reed (2005).

Analysing the pottery samples using the SEM involved two techniques. The first technique, map-scanning, obtained a broad sweep of elemental compositional data of the entire electron micrograph. Scan settings were configured to 4000 pixels, 4 min imaging and 8 min scanning. Selecting what area of the pottery sample to map-scan was done by firstly examining the entire surface of the pottery sample to visually assess some of the basic variation in the inclusion types indicated by grain size, shape and atomic weight (grey to white shading). An area which contained the highest amount of variation in the inclusion types was then chosen and an electron micrograph image produced under either 60 or 80x magnification. Closer images were occasionally taken of individual minerals between 300 and 600x magnification to capture finer structural differences and to assist in their identification.

The second technique, spot point analysis, collected elemental compositional data of a particular point within the micrograph. The spot point analysis was configured to 'Precise' acquisition and between 30-40 points were taken of inclusions for each pottery sample. Ideally, all inclusions pictured in the micrograph were analysed. However, when an excessive number of inclusions were present in the micrograph, which was often the case at 60 or 80x magnification, the points were evenly distributed to sample as much variation as possible in the visual appearance (e.g. size, shape) and chemical colour-coding of the inclusions present in the backscatter and map-scan images. Multiple points were taken of composite inclusions to assist in their identification, and if determined to be a lithic fragment, the fragment was classified as either of volcanic, sedimentary or metamorphic origin. At the outset of using the SEM each day, a Copper standard was analysed to test the accuracy of the spectrometer.

Ten elements were selected: Na, Mg, Al, Si, P, K, Ca, Ti, Mn and Fe. Mineral identification was carried out by comparing the elemental composition of the inclusions, which were displayed in normalized stoichiometric concentrations, to elemental concentrations of geological reference samples in Deer *et al*. (1992, 2013) and the online Mineralogy Database (Barthelmy 2012). Representative samples of the elemental data were also presented in unnormalized form and cross-checked by Assoc. Prof. James Scott from Geology, University of Otago. Local riverine sand samples prepared into thin sections were also petrographically examined by Scott which assisted in corroborating the SEM identifications and discriminating between minerals which possessed similar geochemical compositions.

Analysing the clay matrix of the pottery samples and fired clay samples was carried out in a similar manner, although map scanning was not considered necessary. As less resolution was required in the imaging of the ceramic matrices at 30,000x magnification, the scan settings were reconfigured to 2000 pixels and 1 min imaging. Three areas of the clay matrix of each sample were selected and at least five points were taken at each area. Under very high magnification, it was important to ensure that the clay matrix and not a void or the surface of an inclusion were being analysed. The same ten elements as above were selected, although phosphorous was excluded from the statistical analysis (discussed in section 7.13). The chemical spectra were displayed in normalized stoichiometric concentrations and then statistically tested to enable interpretations to be formed about the compositional variability of the clay used in the making of the pottery.

7.1.3 Statistical analysis of clay chemical data

Statistical testing serves as a valuable tool in geochemical characterisation studies where the primary aims are to investigate how samples relate to one another and to define groups from complex chemical datasets that take into consideration chemical, mathematical and archaeological matters (Summerhayes 2000: 39). In this study, this process involved the use of Principal Component Analysis (PCA) via the program MV-ARCH (Wright 1991), and Hierarchical Cluster Analysis (HCA) performed on SPSS ver.25. These statistical programs and multivariate techniques were selected as they have previously proven effective in characterising chemical groupings of pottery by other researchers in the Pacific (e.g. Summerhayes 1987, 2000; Garling 2007; Shaw 2014; Gaffney 2016). Caution was taken, however, in recognising that statistical methods can generate clusters or groups even when applied to random data (Smith & Dubes 1980). Furthermore, clusters that are created can easily reflect the structure of the clustering algorithm rather than underlying patterns in the chemical data itself. It is, therefore, considered essential that the technique selected is clearly justified and explained.

PCA is a widely used multivariate technique that enables the visual appraisal of the structure or clustering of a dataset. It serves primarily to "reduce the dimensionality of a dataset consisting of a large number of interrelated variables, while retaining as much as possible of the variation present in the dataset" (Joliffe 2002: 1). PCA involves the orthogonal transformation of the original variables – in this case, elemental oxide values – into a new set of uncorrelated variables called principal components (Baxter 1994: 66). The first component accounts for the greatest amount of variation in the data, followed by the second component and so on with the components decreasing in order (Chatfield & Collins 1980: 57). Before calculating the component scores, all data was standardised using the base-10 logarithm on MV-ARCH. MV-ARCH, which is "a package of multivariate programs designed for archaeologists" (Wright 1991: 6), was used in preference to SPSS to carry out the PCA. This was because it proved more effective in accounting for as much variation as possible in the calculation of the component scores[9]. The component scores were plotted using Microsoft Excel, and any outliers visually identified in the PCA that impacted significantly on the clustering were discarded in subsequent analyses.

In a similar manner to PCA, HCA operates on the premise that each sample within a dataset can be regarded as a point in multidimensional space and that those with similar derivations will cluster together (Baxter 1994). Agglomerative HCA orders data by considering samples firstly as separate entities then proceeds to merge each one based on their similarities in even more inclusive clusters until every object is encompassed in one large cluster (Drennan 2009: 310). The results of this ordering can then be presented as a dendrogram. In this study, all three principal component scores (not standardised) formulated during the PCA were used in the hierarchical clustering. Component scores, rather than the standardised elemental oxide values, were selected as the resulting dendrogram clusters resembled more closely mineralogical and stylistic groupings of the pottery.

The Group Average method and Ward's method were employed with true Euclidean distance. The Group Average method, or Average Linkage, defines distance between groups as the average of the distances between every pair of points within each group (Everitt 1977: 15). Whereas for Ward's (1963) method, at each stage of agglomeration, it merges only those two points whose union results in the minimum increase in the error sum of squares. SPSS recommends Squared Euclidean distance to be used with Ward's method, although it was found in this study that it produced a considerably 'space-contracted' or condensed dendrogram (see Baxter 1994: 158). No completely satisfactory statistical solution or method exists for determining the 'correct' number

[9] SPSS appeared to carry out a factor analysis first on the dataset before creating the principal components, which usually resulted in a more even spread of eigen values but less variation being accounted for.

of clusters from a dataset (Everitt 1980: 64-66). Groupings are defined subjectively, but can be of immense value when compared with one another and partnered with other compositional or stylistic information available to the investigator. Multiple statistical tests were carried out for each assemblage which enabled cross-comparisons and greater confidence in ascertaining internal consistency.

All ten elements utilised in the SEM analysis were initially incorporated in the statistical testing: Na, Mg, Al, Si, P, K, Ca, Ti, Mn and Fe. It was decided to remove P, however, based on previous literature demonstrating it to be a common contaminant from deposition in soil (Picon 1987; Walter & Besnus 1989; Schneider 2016: 197). The absorption of P has been argued to be particularly susceptible for low-fired pottery buried alongside bones and organic waste (Freestone *et al*. 1985, 1994). The highest peaks in P recorded in the ceramic matrix of pottery analysed as part of this study were excavated from the midden-rich deposit (SIK-1) on Sikopo which would support this argument.

7.2 Analysis of Pedological Samples

The following section is structured in two segments. The first provides a description of the collection of sand and clay samples in Manning Strait and the steps involved in preparing them for geochemical analysis. The second segment presents results of the geochemical and statistical analyses carried out on the samples.

7.2.1 Collection and Preparation of Sand and Clay Samples

A fundamental objective of the fieldwork carried out as part of this study was centred on site surveying and excavation. Although, to supplement the geochemical characterisation of ceramics collected in the field, three sand samples and two clay samples were collected (Table 7.7). The sand samples were collected from the mouth of Piripea River, located near the base of Mt Kumboro approximately one kilometre north of Rokoso in southeast Choiseul. Piripea River, which is the nearest located mainland river to Laena Island, was sampled to explore if local sands were used as fillers in the making of pottery found on Laena Island and nearby on Wagina. Three different parts of the river mouth were sampled and included a grey fine beach sand (PIR S1), a greenish grey beach sand (PIR S2) and a dark grey stream sand (PIR S3).

The clay samples were collected from two different locations on Wagina. The first was a dark brown clay (WAG C1) taken from the bank of a waterhole located 1.5 km north of Kukutin. The other was a yellowish-brown clayey wet soil (WAG C2) taken from 60 cm within the stratigraphy of a large section exposed for the construction of a new science building at the Wagina Community Highschool. The clay and sand samples, which were approximately 100-300 g in size, were collected with a clean trowel and individually placed in plastic artefact bags. Photographs were taken of the areas of Piripea River and the clay deposits that were sampled (Appendix B). GPS coordinates were recorded of the collection point and notes were taken detailing the sampling location and its stratigraphic context.

Table 7.7 Provenance, colour and GPS locations of sand and clay sample sources.

Sample Code	Provenance	Munsell Colour*	GPS Coordinates
PIR S1	SE Choiseul	GLEY 1 4 / 10Y	S7°19'32.47, E157°32'58.90"
PIR S2	SE Choiseul	GLEY 1 4 / 5GY	" "
PIR S3	SE Choiseul	GLEY 1 3 / 5GY (moist)	" "
WAG C1	Wagina	7.5YR 3/2 ; 2.5YR 4/8	S7°27'26.03, E157°44'55.04"
WAG C2	Wagina	7.5YR 5/6 ; 2.5YR 4/6	S7°28'8.25, E157°44'36.47”

*Before and after firing of clay samples.

The sand samples were prepared into three thin sections and the clay samples were made into two plugs before being analysed under the SEM. Preparing the thin sections involved a similar process to the preparation of plugs described in section 7.1.2 (see step-by-step guide in Wu 2016: 67-68). The clay samples were prepared by firstly pulverising each sample with a clean mortar and pestle. Using distilled water, each clay source was then rolled and moulded to form three 1 cm-diameter clay balls. The balls were then left to dry for two days in room temperature. Two balls, one from each clay source, were left unfired. While the remainder were fired at 650°C and 850°C in a muffle furnace for one hour. These temperatures were selected as ethnographic observations of open firing of pottery in Island Melanesia are recorded to typically reach between 600 to 900°C (Lauer 1974: 57; Clough 1992). All six balls were then segmented using a diamond-edge circular saw, sanded to create a smooth surface, and were then prepared into plugs.

7.2.2 Results from Sand and Clay Sample Analysis

The three sand samples collected from the mouth of Piripea River in southeast Choiseul appeared moderately sorted with subrounded to subangular grains and were homogenous in their mineralogical composition (Figure 7.1). The samples were comprised mainly of metamorphic lithic fragments, hornblendic amphiboles (almost exclusively alumino-tschermakite), Na-rich plagioclase feldspars (namely andesine and

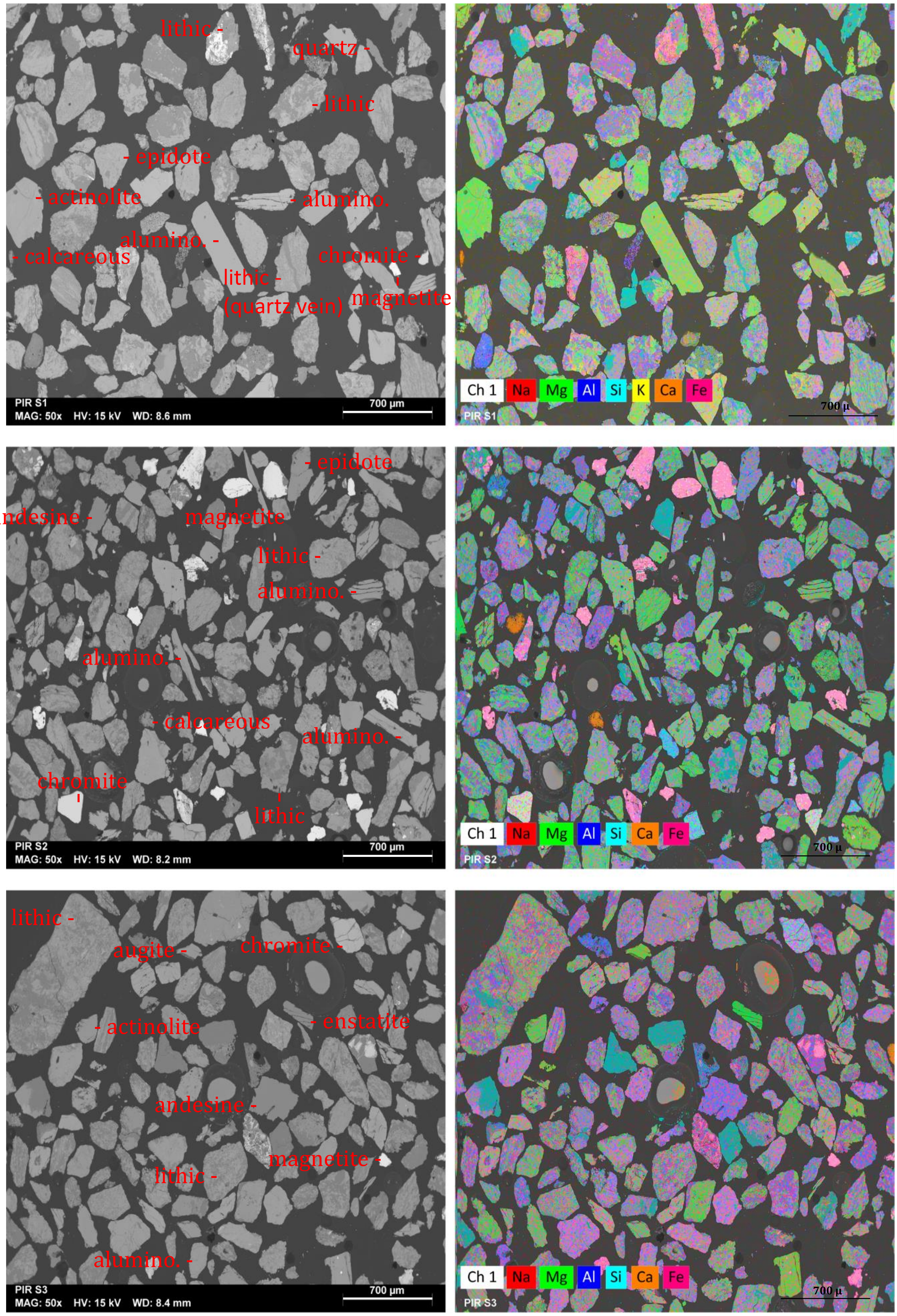


Figure 7.1 Mineral composition of sand samples collected at Piripea River, southeast Choiseul. Electron micrograph (left) and map scan (right) of PIR S1 (top), PIR S2 (middle) and PIR S3 (bottom).

albite), epidote, iron oxides, chromite and titanite. Petrographic analysis confirmed the identification of epidote. Minor inclusions identified in the sand samples included quartz, alkali feldspars (orthoclase and sanidine), clinopyroxene (augite), phosphate and calcareous sands. Orthopyroxene (enstatite) was detected in PIR S3 although these pyroxenes proved to be rare throughout the entire analysis. Slight variations between the mineralogical content of each sample included a higher proportion of iron oxides being detected in PIR S2 compared to the other two. Additionally, PIR S3 contained lithic fragments composed partly of ilmenite and magnetite whereas PIR S1 and PIR S2 were dominated by metamorphic lithic fragments composed of epidote, plagioclase, titanite, actinolite and quartz. Some clasts exhibited quartz veins (Figure 7.1: PIR S1). Sporadically, large (1 mm) lithic fragments were identified, although they typically ranged between 300-500 μ in size. Overall, the lithic fragments were characteristic of the Choiseul Schists formation found predominantly in southeast Choiseul and would classify as metavolcanic using Dickinson's grouping of Oceanic lithic fragments (2006: Table 4).

The two clay samples collected in Wagina were similar in their geochemistry. No noticeable variation was observed between the unfired and fired samples, which corroborates more comprehensive clay firing experimentation (Leclerc 2016: 135). The clays were characterised by a high Si (52%), Al (34%) and Fe (9%) content and minute amounts of Ca, Mg, Ti and Mn (all between 0.1-2%). Noticeably, Na and K were not detected. PCA clustering of these samples against the Wagina pottery and other archaeological specimens is described in section 7.5.3. Quartz was the most dominant and usually the largest natural inclusion observed for WAG C1. This was followed by plagioclase feldspars, namely andesine, and amphiboles, specifically magnesio-hornblende. Other minor natural inclusions identified were very small (<100 μ) iron oxides, alkali feldspars and zircon. The only inclusions observed in WAG C2 were large (400-500 μ) Fe-rich lithic fragments, and smaller iron oxide grains and chromite.

7.3 Santa Isabel Pottery

Pottery from Papatura was manufactured predominantly using marine beach sands and, to a lesser extent, terrigenous sands. The marine beach sands cannot be characterised to a region, however, the terrigenous sands, which were comprised mainly of volcanic minerals including plagioclase, quartz, clinopyroxenes and hornblendes, are exotic to northwest Isabel. The four sherds from Kusira were made using ferromagnesian mineral fillers composed mainly of iron oxides and clinopyroxenes as well as lighter minerals, quartz and plagioclase. Overall, the compositional evidence from both sites supports previous petrographic assignments of Isabel pottery to multiple sources located in Choiseul (Carter pers. comm. 2016).

7.3.1 Fabric Grouping

About 96% of the formal Papatura sherds selected in the fabric analysis grouped in the CA fabric (Table 7.8). Only four non-calcareous sherds were identified, one Fmg and three Light fabrics. For Kusira, the sherds were assigned into three fabric groups: Fmg, Fmg/Light and Light. White inclusions observed on one of the sherds was initially identified as calcareous grains. This was revised following the SEM analysis, however, as none were detected.

Table 7.8 Fabric groups and total number of Isabel sherds analysed macroscopically.

Site	CA	Fmg	Fmg/Light	Light	Total	Assemb. Proportion
Papatura	94	1	-	3	98	23%
Kusira	-	1	1	2	4	100%

7.3.2 Mineralogy

Tables 7.9 and 7.10 summarise the types of inclusions identified in the Papatura and Kusira sherds along with their vessel form and fabric group. They are presented at the end of this section once descriptions of each of the four main fabric groups have been given.

Calcareous

Calcareous inclusions of shell and coral detritus were the most dominant fabric group for the Papatura assemblage (Figure 7.2). Minor inclusions typically identified in this

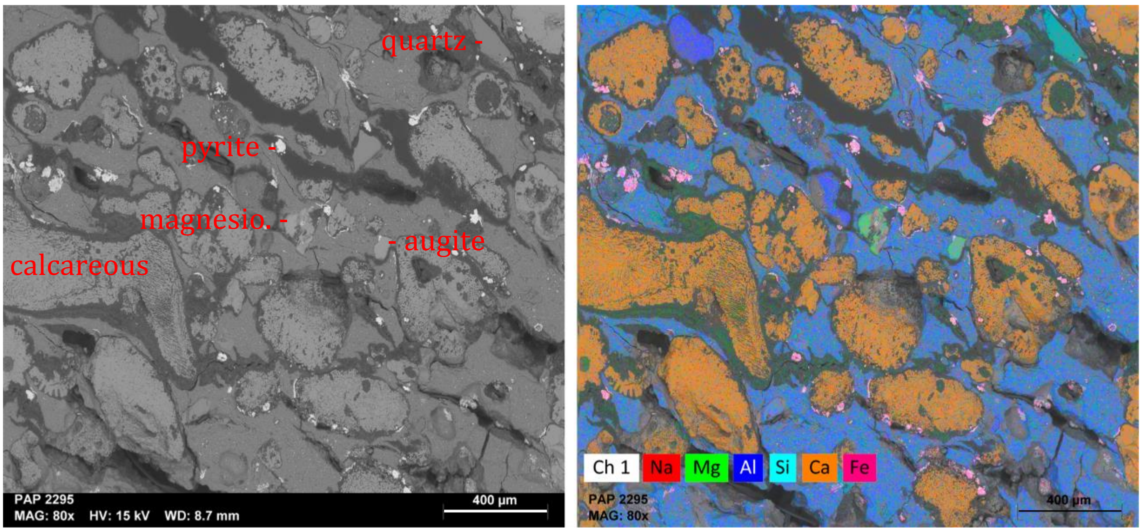


Figure 7.2 Isabel calcareous (CA) fabric. Electron micrograph (left) and map scan (right) of sherd PAP 2295.

fabric were quartz, iron oxide, pyrite, clinopyroxenes, amphiboles, plagioclase feldspars and Al-rich inclusions. The Al-rich inclusions possessed varied geochemical profiles, apart from Al which usually ranged between 50-70% oxides, and sometimes neared 1 mm in size. The accumulation of pyrite, which appeared as very small masses and streaks surrounding some of the calcareous inclusions, arose as a result of the deposition of the sherds in a saltwater and oxygen-deprived marsh environment. A few hornblendic inclusions were observed in some of the calcareous sherds, although their small size (<50 μ) indicated they were likely to be natural clay inclusions. Rarer minerals identified in these sherds included the phosphate mineral, apatite, which was identified in two sherds, and a single zircon mineral identified in one sherd. No lithic fragments were observed in these sherds.

Light

The Light fabric was composed predominantly of quartz and plagioclase feldspars, specifically andesine and labradorite (Figure 7.3). Three of the Papatura sherds (PAP

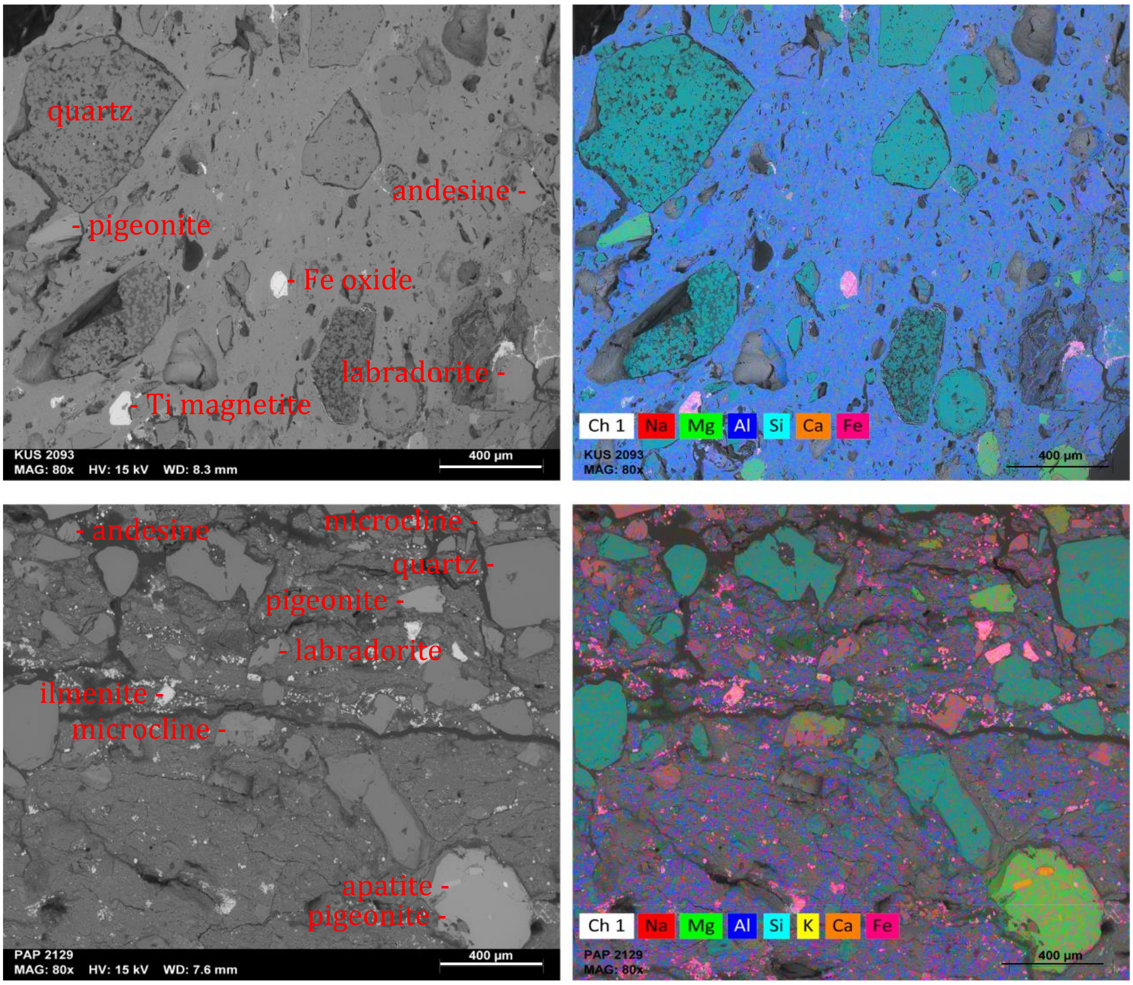


Figure 7.3 Isabel Light fabric. Electron micrographs (left) and map scans (right) of sherds KUS 2093 (top row) and PAP 2129 (bottom row).

2129, 2278 & 3929) and two of the Kusira sherds (KUS 2093 & 2094) were grouped in this fabric. Minor inclusions identified in the Papatura sherds included amphiboles, titanium magnetite, orthoclase, apatite, Al-rich inclusions and igneous lithic fragments. Alkali feldspars such as orthoclase were found in none of the remaining 13 Papatura SEM samples. One of the lithic fragments was composed of pigeonite-apatite-titanium magnetite and another of labradorite, augite and possibly amphiboles. For the Kusira sherds, less common inclusions found in this fabric included ilmenite, iron oxide, phosphate, pyrite, amphiboles, and epidote.

Fmg

The Fmg fabric, which was dominated by iron oxides and pyroxene, was identified among one of the Kusira sherds (KUS 2092) and one of the Papatura sherds (PAP 2125) (Figure 7.4). Minor inclusions identified in KUS 2092 included plagioclase feldspars,

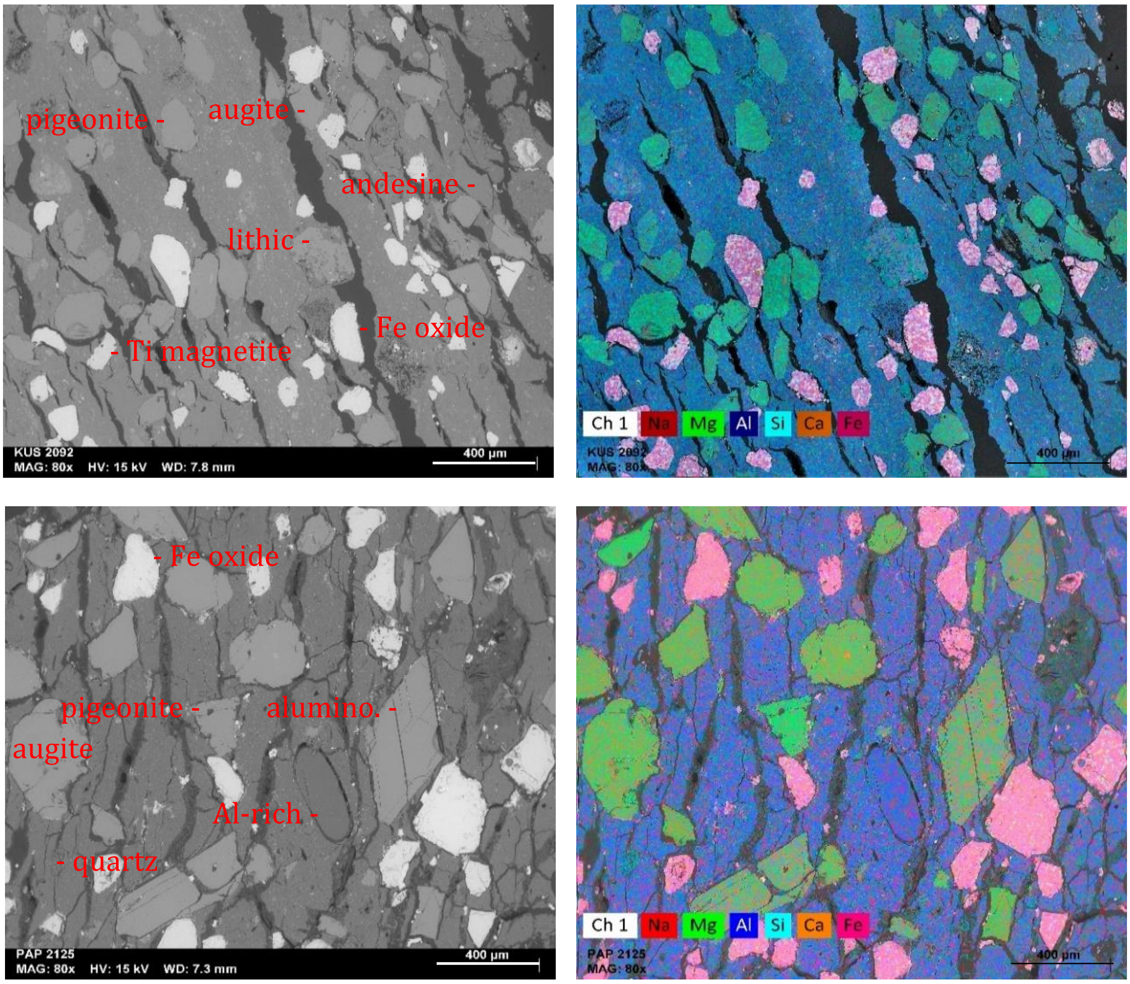


Figure 7.4 Isabel Fmg fabric. Electron micrographs (left) and map scans (right) of sherds KUS 2092 (top row) and PAP 2125 (bottom row).

quartz, possibly cummingtonite and quartz-epidote lithic fragments probably of metamorphic origin. PAP 2125 contained minor amounts of large hornblendes (alumino-tschermakite), quartz, an Al-rich inclusion and an igneous lithic fragment composed of clinopyroxene-plagioclase-hornblende-titanium magnetite.

Fmg/Light

The Fmg/Light fabric was identified from a single sherd from Kusira (KUS 2095) which was rich in both iron oxides and quartz (Figure 7.5). Its minor inclusions included clinopyroxene, magnesio-hornblende, epidote and rutile.

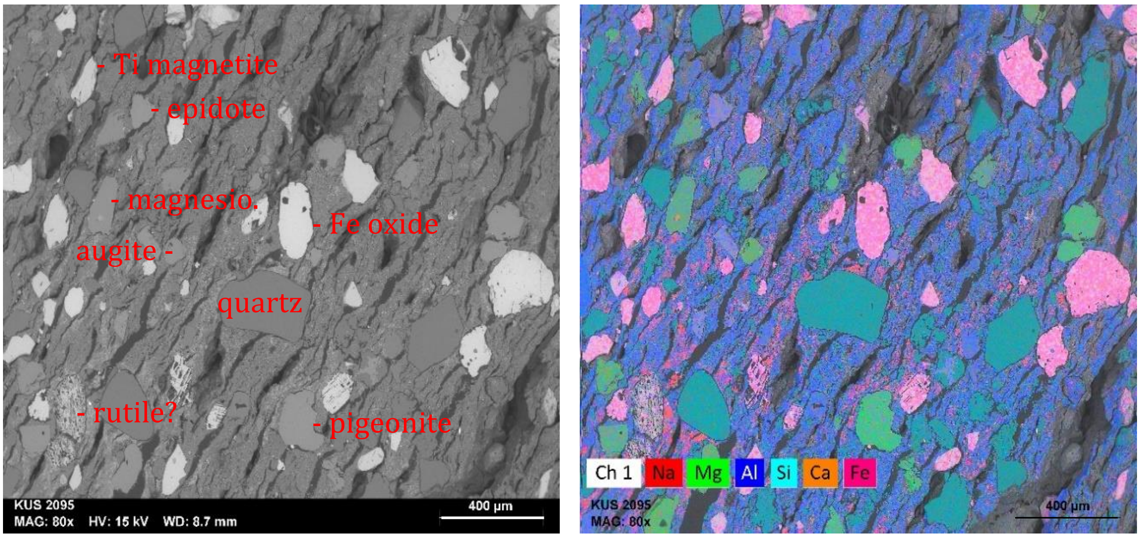


Figure 7.5 Isabel Fmg/Light fabric. Electron micrograph (left) and map scan (right) of sherd KUS 2095.

Table 7.9 SEM identifications of inclusions in Papatura samples.

	Sherd	2120	2217	3810	2301	2279	2272	3812	3851	3852	2295
	Vessel Form	I	I	I	II	III	IV	IV	IV	IV	V
	Fabric	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA
Calcareous	Coral/shell detr.	X	X	X	X	X	X	X	X	X	X
Amphiboles	Cummingtonite										
	Actinolite										
	Ferro-actinolite										
	Magnesio-horn.	X					X				X
	Edenite										
	Alumino-tsch.		X		X				X		
	Kaersutite										
	Gedrite										
	Indeterminate										
Clinopyroxene	Pigeonite					X				X	X
	Augite				X						X
Plagioclase	Albite										
	Oligoclase										
	Andesine		X				X		X	X	X
	Labradorite	X	X			X			X		X
	Bytownite					X					X
	Anorthite										
	Indeterminate										
Alkali feldspar	Anorthoclase										
	Orthoclase										
	Microcline										
	Sanidine										
	Indeterminate										
Epidote	Anorthosite										
Quartz	Quartz	X		X	X	X	X	X	X	X	X
Non-Silicates	Ilmenite										
	Iron oxide	X		X						X	X
	Ulvospinel	X					X	X	X		
	Sulphide (pyrite)	X	X	X	X	X	X	X	X	X	X
	Phosp. (apatite)	X									
	Rutile?										
Other	Lithic										
	Zircon						X				
	Chromite										
	Al-rich inclus.	X	X	X	X	X		X	X	X	X

Table 7.10 SEM identifications of inclusions in Papatura samples (ctd.) and Kusira samples.

		Papatura					Kusira			
	Sherd	2125	2129	2278	2127	3824	2095	2092	2094	2093
	Vessel Form	IV	IV	IV	V	-	IV	-	-	-
	Fabric	Fmg	Light	Light	CA	CA	F/L	Fmg	Light	Light
Calcareous	Coral/shell detr.				X	X				
Amphiboles	Cummingtonite							X	X	X
	Actinolite									
	Ferro-actinolite			X					X	
	Magnesio-horn.			X	X		X		X	
	Edenite									
	Alumino-tsch.	X								
	Kaersutite									
	Gedrite									
	Indeterminate									
Clinopyroxene	Pigeonite	X	X	X			X	X		
	Augite	X		X			X	X		X
	Ferroan augite									
	Indeterminate					X				
Plagioclase	Albite									
	Oligoclase									
	Andesine		X	X				X	X	X
	Labradorite		X	X		X			X	X
	Bytownite				X	X				
	Anorthite									
	Indeterminate									
Alkali feldspar	Anorthoclase								X	
	Orthoclase			X						
	Microcline		X							
	Sanidine									
	Indeterminate									
Epidote	Piemontite			X			X			
Quartz	Quartz	X	X	X		X	X	X	X	X
Non-Silicates	Ilmenite		X	X						
	Iron oxide	X	X	X			X	X		X
	Ulvospinel					X	X	X	X	X
	Sulphide (pyrite)		X	X	X	X				X
	Phosp. (apatite)		X			X				X
	Rutile?						X			
Other	Lithic	X	X	X				X		
	Zircon									
	Chromite									
	Al-rich inclus.	X		X	X					

7.3.3 Ceramic matrix

The clay chemical data of the Papatura and Kusira sherds indicated that at least two separate clay deposits were used in the manufacture of pottery from both sites. Overall, the first and second PCA analyses, illustrated by Figures 7.6 and 7.7 respectively, and the dendrogram (Figure 7.8) demonstrated clear separation between the bulk of the Papatura assemblage and the Kusira samples.

The first analysis of Components 1 and 2 accounted for approximately 79.8% of variation, and the second analysis of Components 1 and 3 resulted in a similarly high representation of variation (78.7%). For both PCAs, the sherds separated predominantly on the first axis, on which Mg, Ca and Na loaded heavily (Table 7.11).

Table 7.11 Variable loadings for PCA analyses of Isabel ceramic matrices.

Element	Component 1	Component 2	Component 3
Na_2O	-0.41	-0.17	0.17
MgO	0.53	-0.04	0.02
Al_2O_3	0.02	-0.01	-0.12
SiO_2	-0.10	-0.02	-0.01
CaO	0.44	0.01	0.12
TiO_2	-0.04	0.03	-0.15
FeO	-0.25	0.27	0.08
K_2O	-0.20	-0.08	-0.11

The second PCA exhibited clustering of the three non-calcareous Papatura sherds to form their own sub-group, which suggests these vessels may have been made with a different clay paste to the bulk of the assemblage. Although it is more likely, as the first PCA and dendrogram demonstrated, that these non-calcareous vessels were manufactured using clay sources geochemically similar to the Kusira samples. This was supported by the similar suites of mineral inclusions identified in both the non-calcareous Papatura sherds and the Kusira sherds.

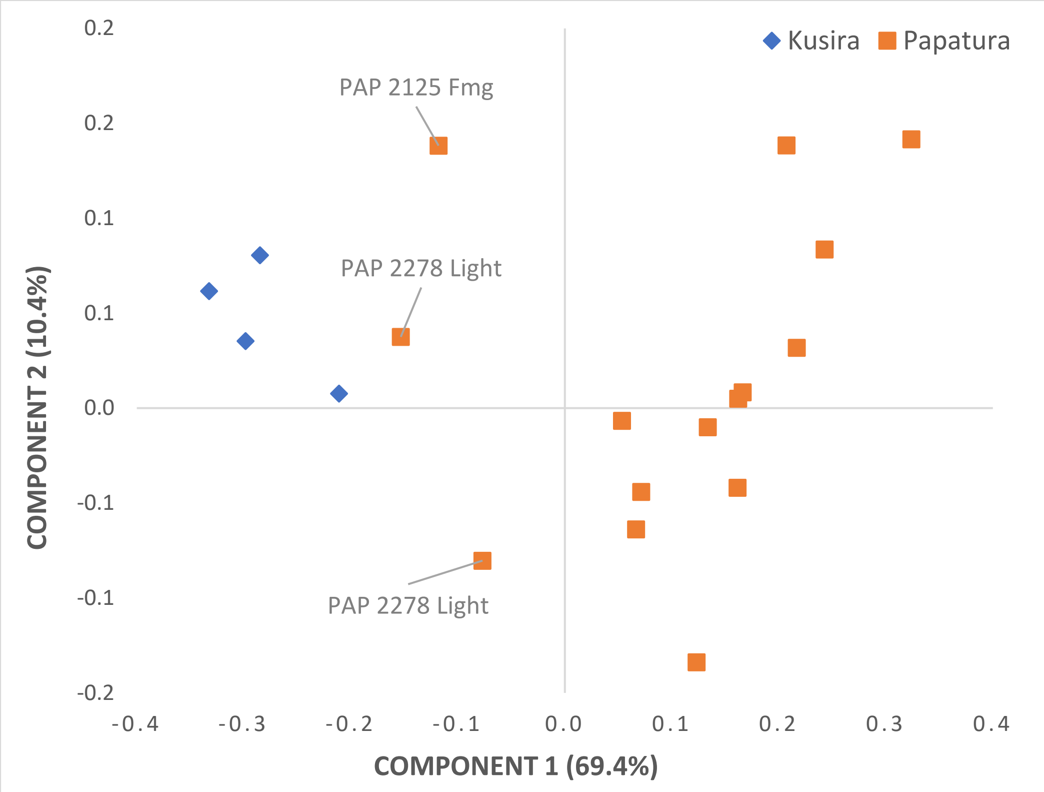


Figure 7.6 PCA 1: scatter plot of Components 1 and 2 of Papatura and Kusira sherds.

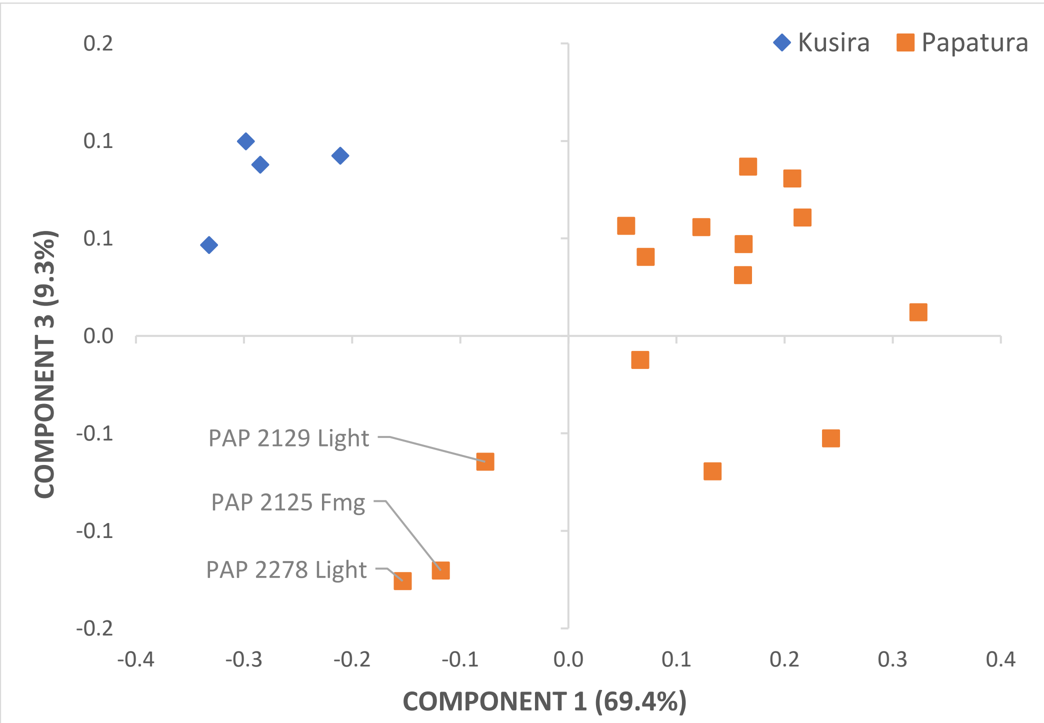


Figure 7.7 PCA 2: scatter plot of Components 1 and 3 of Papatura and Kusira sherds.

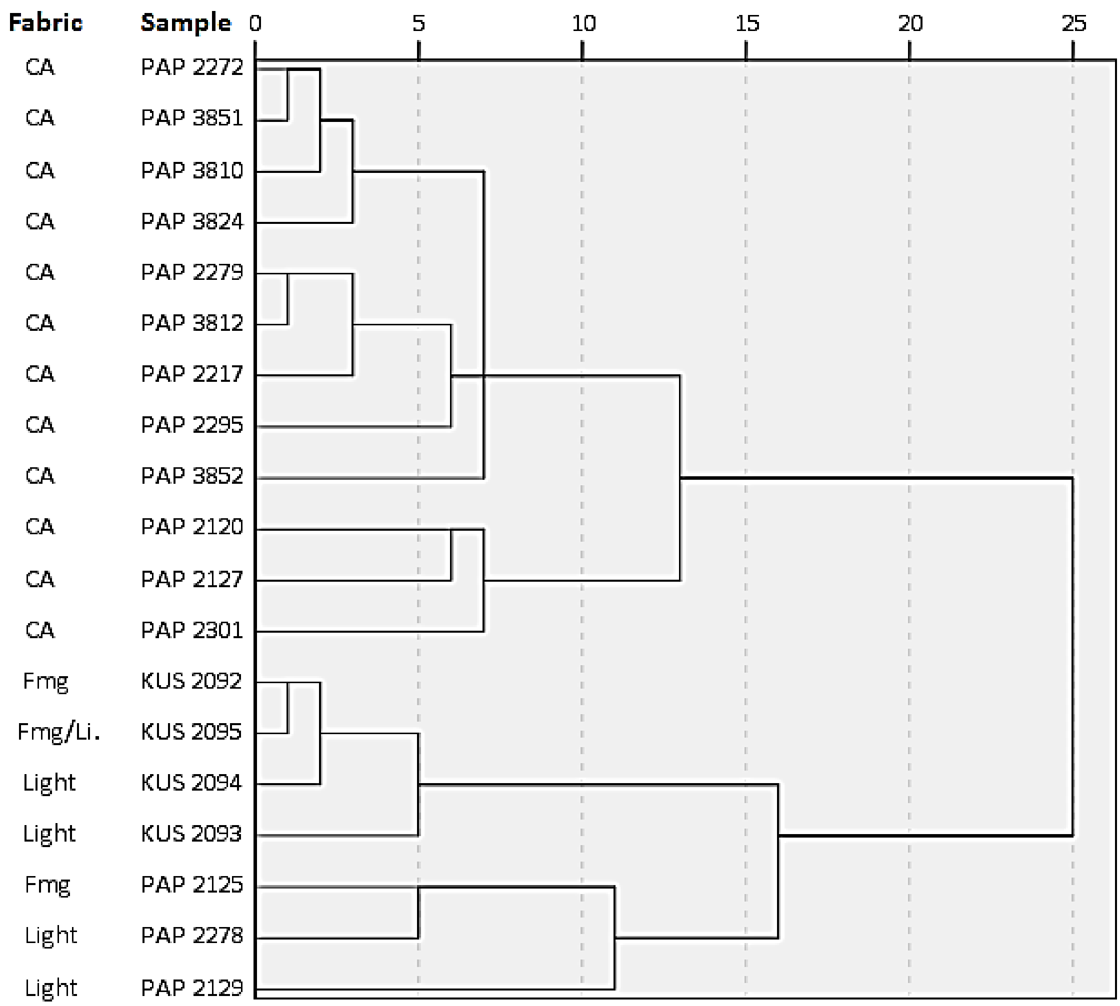


Figure 7.8 Dendrogram of Papatura and Kusira samples using Group Average Method.

7.4 Arnavon Islands Pottery

Pottery recovered on Sikopo was manufactured primarily using terrigenous sands, although one sherd (SIK 410) contained a high degree of calcareous sands. The mineralogical composition of the bulk of the SEM samples selected from Sikopo suggests the pottery was manufactured in Choiseul. One vessel (SIK 531), however, possessed a distinctive fabric which was well-sorted and composed mainly of iron-oxides and clinopyroxene as well as minor amounts of olivine. Notably, olivine was identified in no other sherds in the entire Manning Strait assemblage. This sample was found on Shrine F33 (SIK-3), separate from the remaining bulk of the assemblage recovered on the surface and during the excavation of Area A (SIK-1). The fabric indicates the vessel was likely to have been manufactured using a placer sand from basaltic and more olivine-rich environments characteristic of the New Georgia group (Dickinson 2006: Fig. 21).

7.4.1 Fabric Grouping

The macroscopic fabric analysis demonstrated that approximately 74% of the formal sherds from Sikopo grouped in the Fmg fabric (Table 7.12). The second most commonly observed fabric type was Fmg/Light, followed by Light. While only one diagnostic sherd possessed mainly calcareous inclusions. All five sherds excavated in Lianga Tafa (SIK-2) were grouped into the Fmg fabric, and the same was the case for the vessel portion fragmented into seven pieces on Shrine F33.

Table 7.12 Fabric groups and total number of Sikopo sherds per site analysed macroscopically.

Site	CA	Fmg	Fmg/Light	Fmg Hybrid	Light	Total	Assemb. Proportion
Area A	1	117	32	5	8	163	19%
Lianga Tafa	-	7	-	-	-	7	100%
Shrine F33	-	7	-	-	-	7	100%
Total	1	131	32	5	8	177	20.4%

Table 7.13 Stratigraphic distribution of fabric groups in Area A excavation.

Layer	CA	Fmg	Fmg/Light	Fmg Hybrid	Light	Total
1a	-	5	3	1	2	11
1b (625-500 calBP)	-	31	12	5	-	48
1c (825-700 calBP)	1	12	8	-	-	21
Total	**1**	**48**	**23**	**6**	**2**	**80**
% of sample	**1%**	**60%**	**29%**	**7.5%**	**2.5%**	**100.0%**

Stratigraphic evidence from the 3 m^2 excavation carried out at Area A demonstrated a similar pattern of Fmg being the most dominant fabric, followed by Fmg/Light (Table 7.13). The single CA sherd was recovered in Layer 1c, indicating deposition during the first phase of occupation of the site. Sherds infilled with the Fmg Hybrid and Light tempers appeared confined to Layers 1a and 1b, suggesting they date to the same time or later than the second phase of occupation of the site. Only one neck/shoulder portion was identified to possess a Fmg Hybrid temper and the remainder were body sherds. As all these sherds were of similar thickness and exhibited burnishing, it is possible only one or a small number of vessels with this distinct fabric were discarded at the site. Similarities of this temper with examples from Nuatambu suggest the derivation of the vessel from there. Sherds possessing Light inclusions were also confined to the topsoil and the surface of Area A. In similar fashion to the Fmg Hybrid sherds, the few diagnostic portions grouped into the Light fabric indicated a small number of vessels discarded at the site possessed this quartz and plagioclase-dominated fabric.

7.4.2 Mineralogy

Tables 7.14 and 7.15 summarise the types of inclusions identified in the Sikopo sherds along with their stratigraphic context, vessel form and fabric group. These tables are presented at the end of this section once the five main fabric groups have been described.

Fmg

Calcic amphiboles were the most commonly identified minerals in this fabric, although, variation was detected between the samples. Four sub-groups were identified: an amphibole-rich group, an amphibole and lithic blend, an amphibole-clinopyroxene-iron oxide blend, and a distinctive clinopyroxene and iron oxide blend (Figures 7.9 & 7.10). The amphibole-rich group was dominated by actinolite and ferro-actinolite minerals and some moderate-sized (500 µ) hornblendes (magnesio-hornblende and alumino-

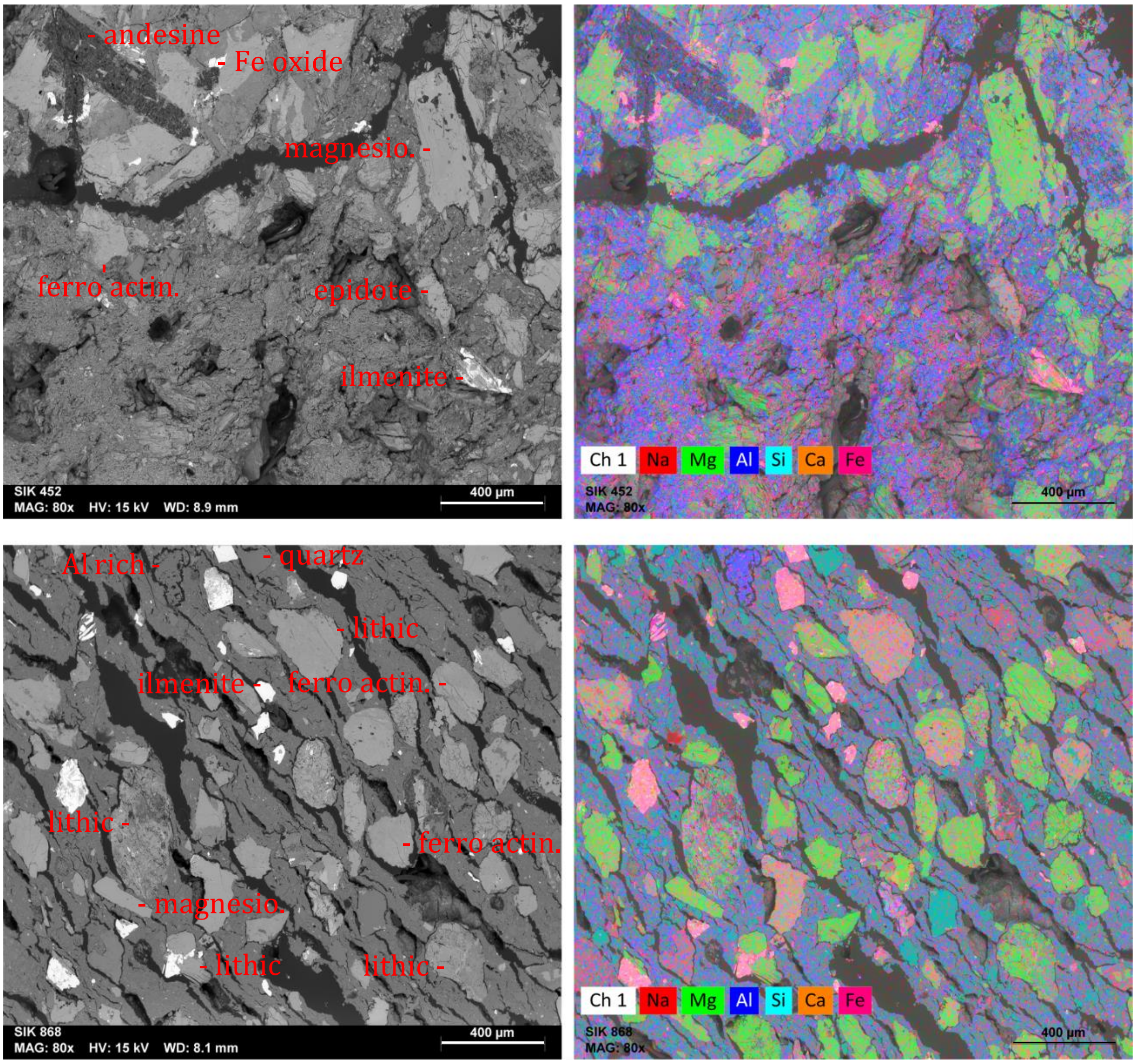


Figure 7.9 Arnavons Fmg fabric sub-groups: amphibole-rich group (top row) and amphibole/lithic blend (bottom row).

tschermakite). The amphibole/lithic blend was similar but contained an equal abundance of lithic fragments, mainly of metamorphic origin. Andesitic lithic fragments were also identified, composed of augite, oligoclase and orthoclase. The amphibole/clinopyroxene/Fe oxide blend differed by containing a more balanced quantity of these ferromagnesian minerals. Minor inclusions typically identified in these three sub-groups included quartz, plagioclase and epidote.

The distinctive clinopyroxene/iron oxide fabric was identified from a single sherd found on Shrine F33. It was dominated by iron oxide and augite, and distinctively, contained lesser amounts of olivine, identified most likely to be forsterite and hortonolite (Figure 7.10). Other minor inclusions included hornblende (alumino-tschermakite), quartz and metamorphic lithic fragments composed of either andesine-sulphate-orthoclase-titanium magnetite or orthoclase and quartz.

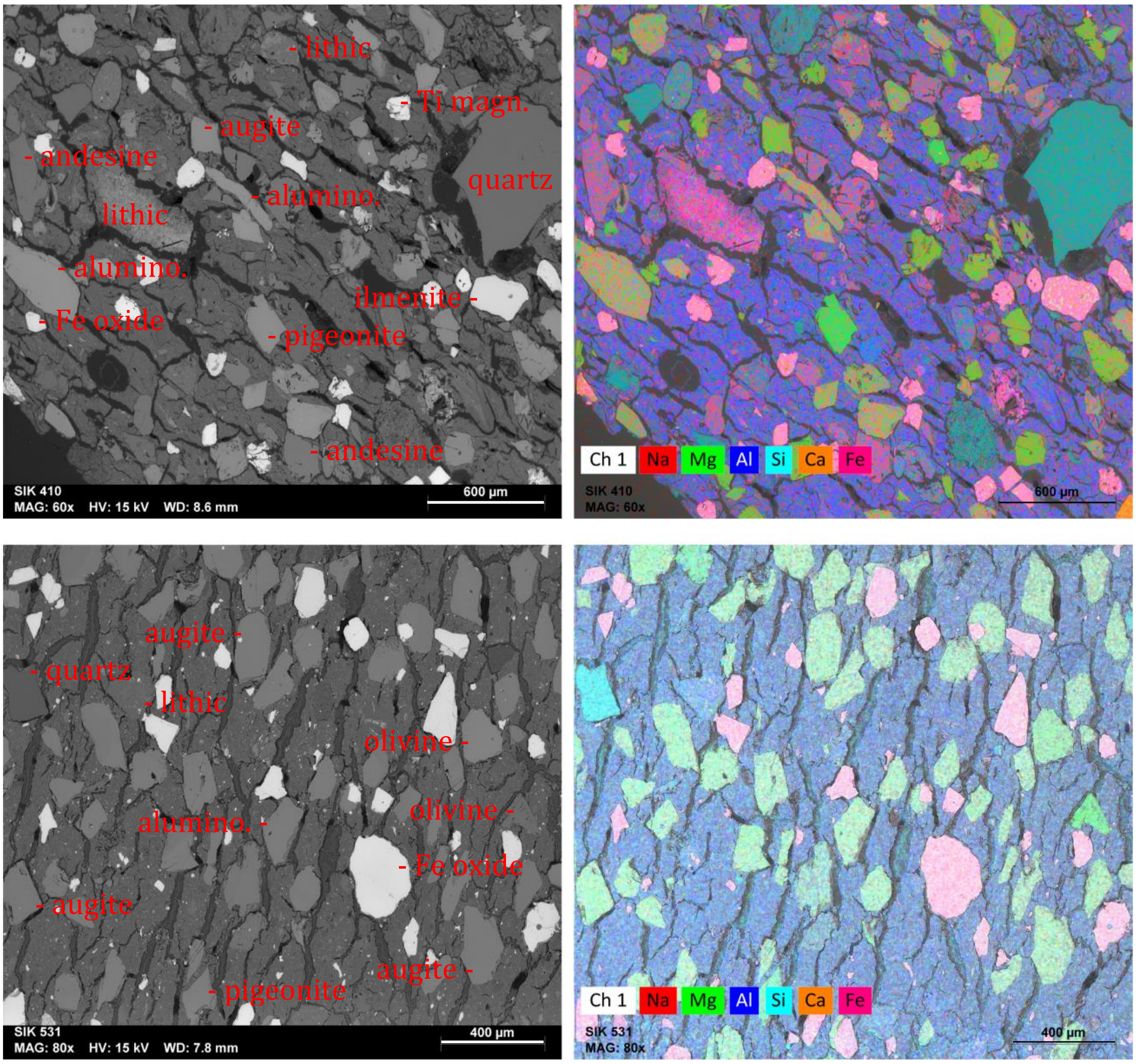


Figure 7.10 Arnavons Fmg fabric sub-groups (ctd.): amphibole/clinopyrx./Fe oxide blend (top row) and clinopyroxene/Fe oxide blend (bottom row).

Fmg Hybrid

The single Fmg Hybrid sherd, SIK 291, included in the SEM analysis contained an abundance of amphiboles, namely actinolite (Figure 7.11). Its minor inclusions included titanium magnetite, augite and both igneous and metamorphic lithic fragments. It appeared similar to the amphibole-rich fabric, although, importantly, it also contained large white inclusions that were not detected in the other fabrics during the macroscopic analysis. These inclusions were identified to most likely be a clay silicate with a chemical composition of 55% Si, 30% Al and 15% Ca.

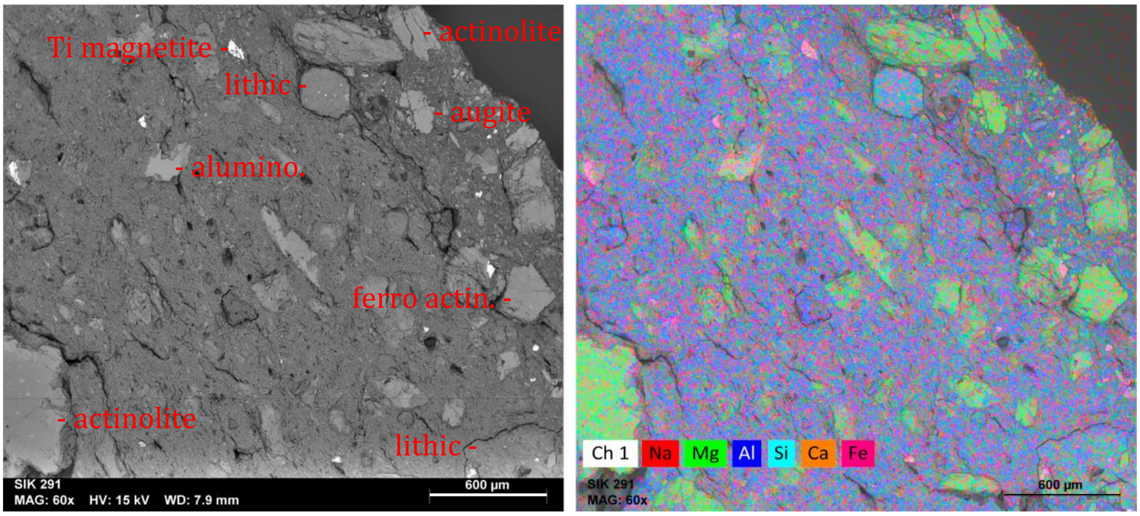


Figure 7.11 Arnavons Fmg Hybrid fabric. Electron micrograph (left) and map scan (right) of sherd SIK 291.

Calcareous

The single CA sherd (SIK 413) was dominated by shell and coral detritus, and contained minor amounts of titanium magnetite, plagioclase (andesine and labradorite), quartz

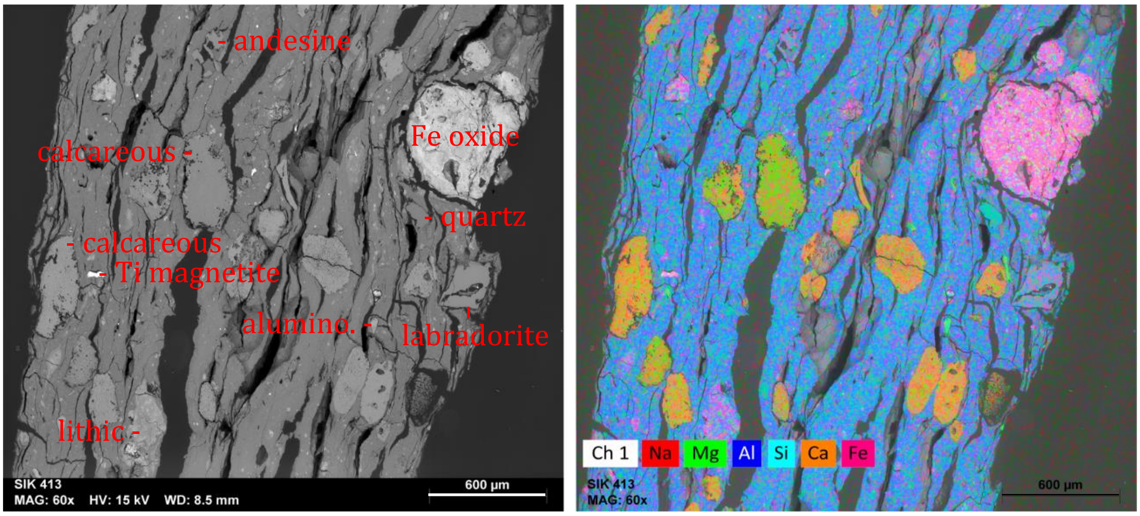


Figure 7.12 Arnavons Calcareous (CA) fabric. Electron micrographs (left) and map scans (right) of sherds SIK 52 (top row) and SIK 653 (bottom row).

and small (<100 µ) hornblende (Figure 7.12). The small size and infrequency of the hornblende suggests it was likely to have been a natural clay inclusion. Several large (>500 µ) Al and Fe-rich inclusions were identified in this sherd, and occasionally in some of the other sherds. They were predominantly composed of iron oxide and possibly kaolinite as well as small amounts of quartz, and may have derived from sedimentary clasts.

Light

The Light fabric sherds were dominated by metamorphic lithic fragments and large (1 mm) quartz grains (Figure 7.13). Lithic fragments analysed in SIK 52 were composed of albite-quartz-gedrite and orthoclase-oligoclase-iron oxide. Similarly, compositions of lithic fragments in SIK 653 included albite-epidote-actinolite-quartz, orthoclase-epidote-oligoclase and oligoclase-epidote-titanite. This fabric contained minor amounts of clinopyroxene, ilmenite and iron oxides.

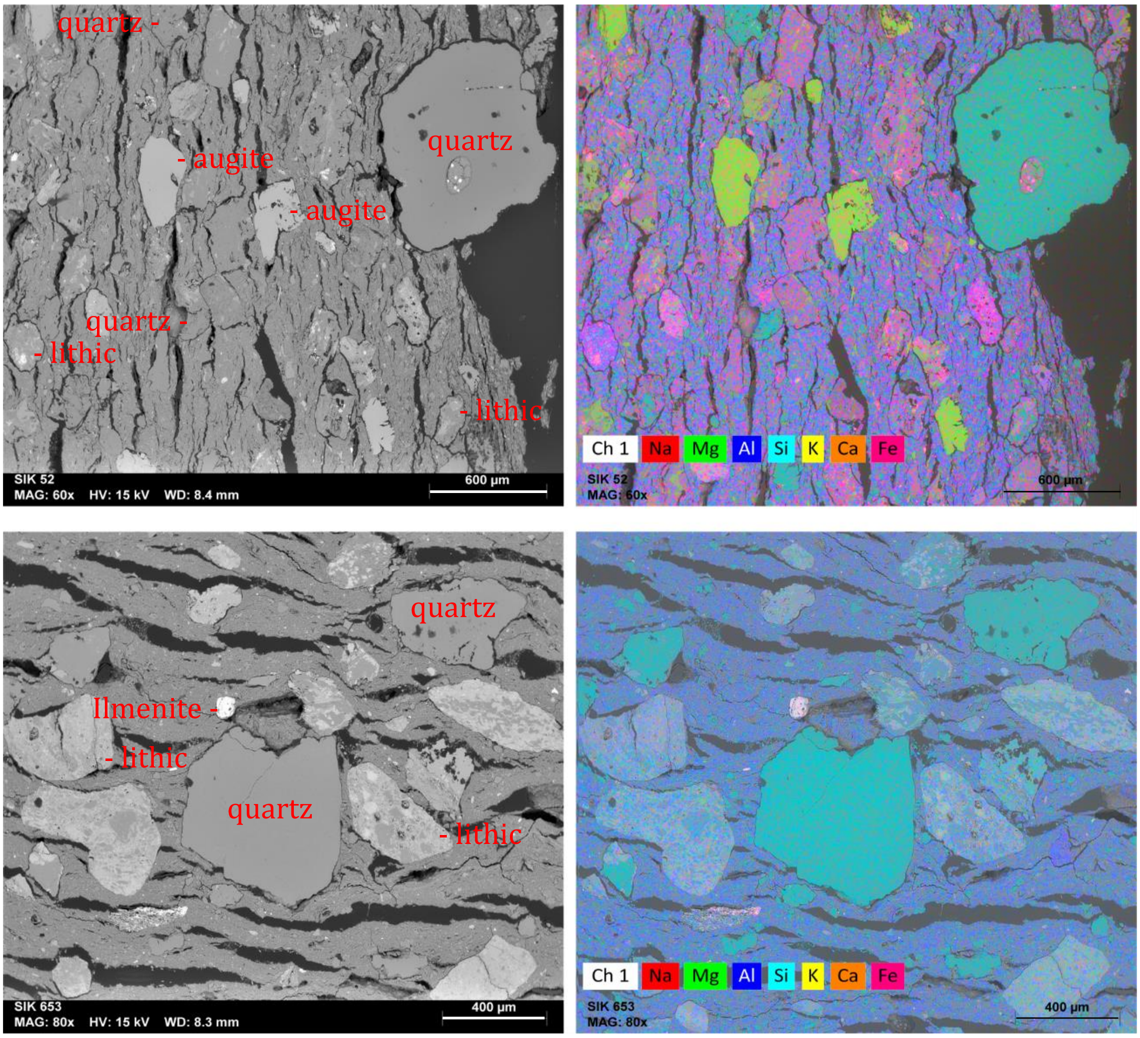


Figure 7.13 Arnavons Light fabric. Electron micrographs (left) and map scans (right) of sherds SIK 52 (top row) and SIK 653 (bottom row).

Fmg/Light

The Fmg/Light sherds were characterised by an equal abundance of plagioclase feldspars, namely andesine and labradorite, and the amphiboles, actinolite and magnesio-hornblende (Figure 7.14). Minor inclusions included iron oxide, ilmenite, quartz, epidote, clinopyroxene, and both metamorphic and igneous lithic fragments. The metamorphic fragments were typically composed of oligoclase-ferro-actinolite-titanite and the igneous fragments of oligoclase-iron oxide-ilmenite-ferro-actinolite and sometimes gedrite.

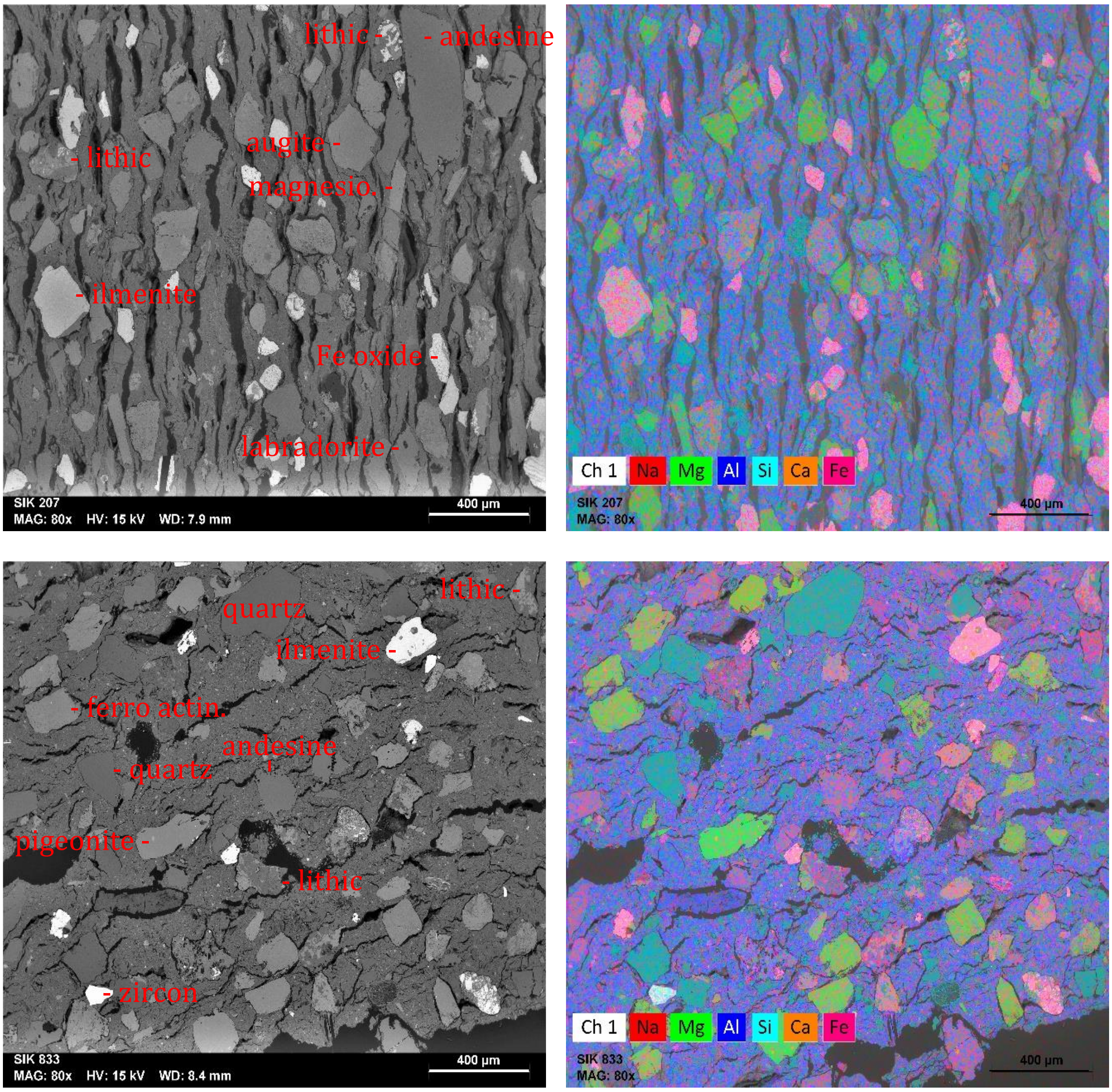


Figure 7.14 Arnavons Fmg/Light fabric. Electron micrographs (left) and map scans (right) of sherds SIK 207 (top row) and SIK 833 (bottom row).

Table 7.14 SEM identifications of inclusions in excavated Sikopo samples.

	Sherd	52	82	113	207	291	304	410	452	473	413
	Layer	1a	1b	1b	1b	1b	1b	1c	1c	1c	1c
	Vessel Form	VI	VI	-	IV	-	IV	-	-	-	-
	Fabric	Light	F/L	F/L	F/L	Fmg H.	Fmg	Fmg	Fmg	Fmg	CA
Calcareous	Coral/shell detr.										X
Amphiboles	Cummingtonite										
	Actinolite					X			X		
	Ferro-actinolite		X	X	X	X	X		X	X	
	Magnesio-horn.		X	X	X				X		
	Edenite										
	Alumino-tsch.			X		X		X	X	X	X
	Kaersutite										
	Gedrite	X					X				
	Indeterminate			X	X					X	
Clinopyroxene	Pigeonite				X			X			
	Augite	X	X	X	X	X	X	X			
	Ferroan augite										
Plagioclase	Albite	X									
	Oligoclase	X		X			X	X	X	X	
	Andesine	X	X	X	X	X	X	X	X	X	X
	Labradorite		X		X		X	X			X
	Bytownite										
	Anorthite										
	Indeterminate										
Alkali feldsp.	Anorthoclase										
	Orthoclase	X		X			X				
	Microcline	X								X	
	Sanidine										
	Indeterminate							X			
Epidote	Anorthosite		X	X	X		X		X	X	
Quartz	Quartz	X	X	X	X		X	X		X	X
Non-Silicates	Ilmenite		X	X	X	X	X	X	X		
	Iron oxide	X	X	X	X	X	X	X	X		X
	Ulvospinel			X	X	X	X	X		X	X
	Titanite										
	Sulphate	X									
Other	Lithic	X	X	X	X	X	X	X	X	X	
	Zircon										
	Al-rich incls.			X		X				X	
	Rutile?		X							X	

Table 7.15 SEM identifications of inclusions in surface Sikopo samples.

	Sherd	841	833	858	857	755	868	653	531
	Vessel Form	I	VI	V	V	VI	-	-	-
	Fabric	Fmg	F/L	Fmg	Fmg	Fmg	Fmg	Light	Fmg
Calcareous	Coral/shell detr.								
Amphiboles	Cummingtonite								
	Actinolite								
	Ferro-actinolite	X	X	X	X	X	X	X	
	Magnesio-horn.	X		X	X	X	X		
	Edenite								
	Alumino-tsch.		X	X	X		X		X
	Kaersutite								
	Gedrite			X				X	
	Indeterminate						X		
Clinopyroxene	Pigeonite		X		X				X
	Augite	X	X	X	X	X			X
	Ferroan augite								
Plagioclase	Albite	X	X			X		X	
	Oligoclase	X	X	X	X	X	X	X	
	Andesine	X	X	X	X	X	X		
	Labradorite	X	X	X	X			X	
	Bytownite		X						
	Anorthite								
	Indeterminate					X			
Alkali feldsp.	Anorthoclase								
	Orthoclase			X		X		X	
	Microcline								
	Sanidine							X	
	Indeterminate								
Olivine	Forsterite								X
Epidote	Anorthosite	X	X	X	X	X	X	X	
Quartz	Quartz	X	X	X	X	X	X	X	X
Non-Silicates	Ilmenite	X	X	X	X	X	X	X	
	Iron oxide	X		X		X	X	X	X
	Ulvospinel		X		X	X	X		X
	Titanite	X					X		
	Sulphate								
Other	Lithic	X	X	X	X	X	X	X	X
	Zircon		X						
	Al-rich incls.	X					X		
	Rutile?					X			

7.4.3 Ceramic matrix

The clay chemical data of the Arnavon Islands pottery did not demonstrate any clear patterning that corroborated with the mineralogical evidence or stratigraphic provenance of the samples. With the presumption that different clay sources may have been used to manufacture pottery discarded during the second and first phases of prehistoric occupation of Sikopo, it was expected that sherds sampled from Layers 1a and 1b may cluster separately from those of Layer 1c. The PCA scatter plots, Figures 7.15 and 7.16, and the dendrogram (Figure 7.17) did not demonstrate this. Rather, the analyses, namely the second PCA and the HCA, demonstrated a more favourable scenario of the clay being procured from a single resource zone which the mineralogical data suggested is very likely to have been located in Choiseul.

Two PCA analyses were carried out, the first with K and the second with K excluded. The first PCA, which accounted for approximately 90.8% of variation, demonstrated clear separation of the assemblage based on the detection of K (Figure 7.15). Specifically, the four sherds clustering at the far left of the scatter plot contained K while the others did not.

Table 7.16 Variable loadings for PCA analyses of Sikopo ceramic matrices.

Element	PCA 1		PCA 2	
	Component 1	Component 2	Component 1	Component 2
Na2O	0.09	0.37	0.39	0.12
MgO	0.09	0.45	0.47	-0.10
Al2O3	0.34	-0.23	-0.24	-0.01
SiO2	0.21	-0.17	-0.16	-0.13
CaO	0.42	-0.09	-0.19	-0.24
TiO2	0.33	-0.20	-0.22	0.30
FeO	0.31	-0.03	-0.05	0.06
K2O	-1.78	-0.09	-	-

A second PCA was run without K and this illustrated most of the sherds grouping more closely with one another near the centre of the scatter plot (Figure 7.16). In this analysis, which accounted for approximately 77% of the variation, Mg and Na loaded heavily on the first component and Ti and Ca loaded heavily on the second component (Table 7.16). The indiscriminate separation of some of the sherds in both the second PCA and the dendrogram made it difficult to make any conclusive interpretations about the number of clay sources used in the manufacture of the pottery found at the site. One finding, however, was reoccurring evidence of the exotic New Georgia vessel, SIK 531, clustering separately on its own from most of the remaining Choiseul-derived ceramics. This was exhibited most closely by the second PCA and to some extent by the first PCA and the dendrogram.

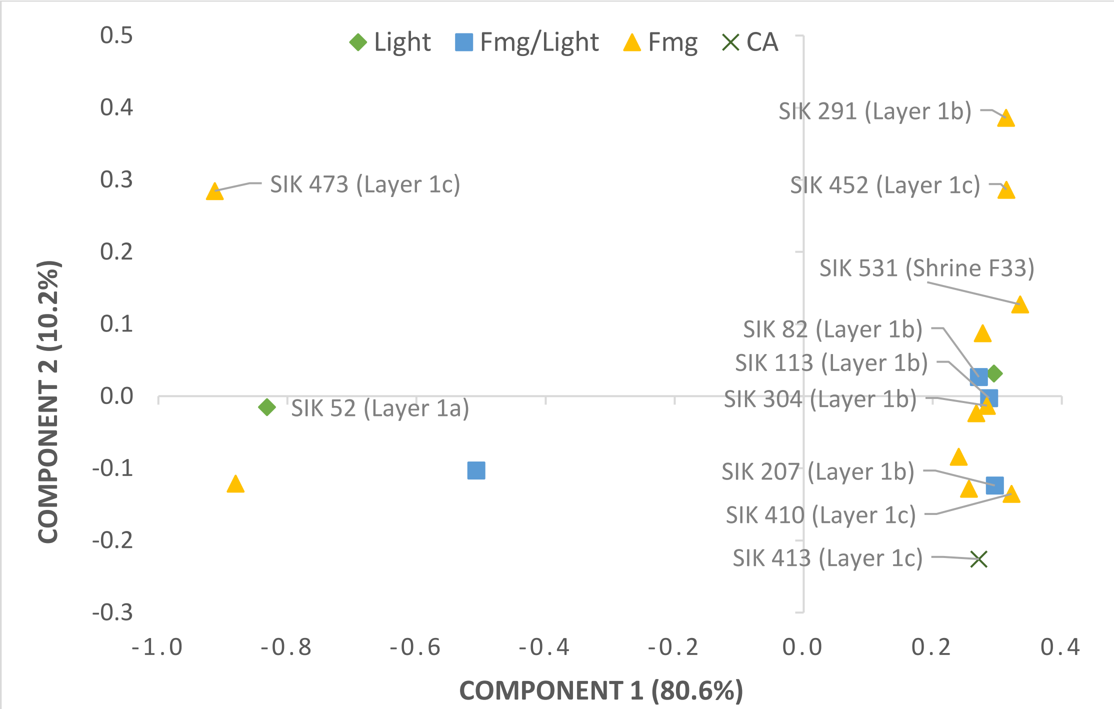


Figure 7.15 PCA 1: scatter plot of Components 1 and 2 of Sikopo sherds with K. Unlabelled plots are surface finds.

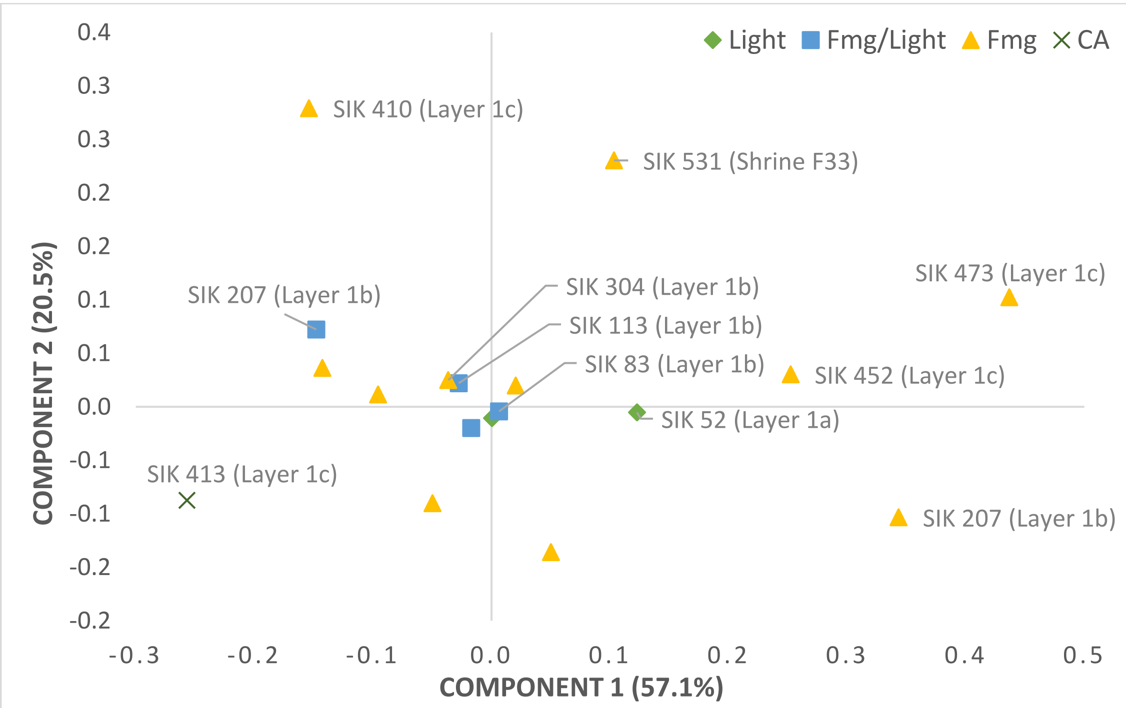


Figure 7.16 PCA 2: scatter plot of Components 1 and 2 of Sikopo sherds without K. Unlabelled plots are surface finds.

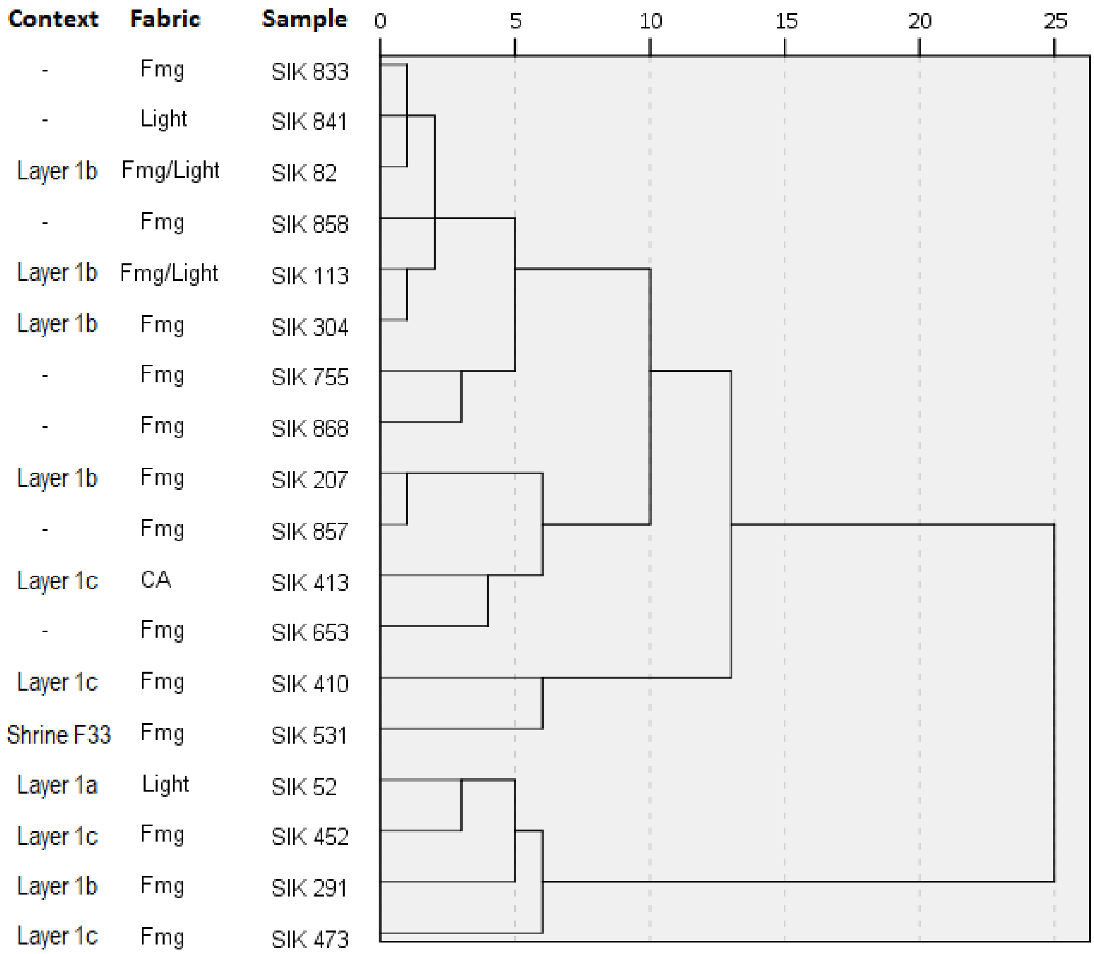


Figure 7.17 Dendrogram of Sikopo sherds using Wards Method without K.

7.5 Choiseul Pottery

Pottery recovered on Nuatambu, Sao, Laena Island and Wagina were manufactured predominantly using terrigenous sands, although calcareous sand grains were found sporadically in some of the Nuatambu sherds and in one of the Laena Island sherds. Placer beach sands are abundant near Nuatambu, and riverine sands are located on the mainland near Sao and Laena Island, so it was considered likely that the fillers identified in the pottery found at these sites would be locally derived. Only marine beach sands are available on Wagina, so it was presumed that pottery found on the island was more likely to have been manufactured on the Choiseul mainland.

Overall, the mineralogical composition of the Choiseul SEM samples was fairly uniform and suggested local manufacture. There was some indication, however, of intra-regional production patterns exhibited by the absence or presence of epidote. The mineral was commonly identified in the Sao, Laena Island and Wagina samples whereas it appeared rarer for the Nuatambu pottery. It appeared likely then that the former assemblages were made locally in southeast Choiseul, as exposures of metamorphic bedrock are mainly found in southeast Choiseul but do occur in patches as far north as Sasamungga. Further support for this was provided by the analysis of the riverine sands collected near Rokoso which were epidote-rich. More thorough sampling of local riverine and placer beach sands available near pottery scatter sites across Choiseul would be required, however, to test this further.

7.5.1 Fabric Grouping

The majority of the Choiseul pottery analysed macroscopically grouped in the Fmg fabric (Table 7.17). This comprised 66.9% of the Nuatambu sample, 60.7% of the Laena Island sample, 64% of the Wagina sample and both of the Sao sherds. The Nuatambu assemblage possessed the highest proportion of Fmg Hybrid sherds out of all the Manning Strait pottery. This fabric, which was characterised by a combination of black ferromagnesian minerals and large (1-5 mm) white inclusions usually appearing pearly in luster, accounted for 19.2% of the Nuatambu sample. In contrast, Fmg Hybrid sherds only constituted 3.7% and 1.4% of the Laena Island and Wagina samples, respectively. These assemblages were characterised by higher proportions of Fmg/Light sherds, which formed approximately 30% for both sites, as well as larger sized light mineral grains. There were no considerable differences between the degree of sorting and angularity or roundedness of the mineral grains between the samples. Although, Nuatambu sherds were typically the smoothest in feel.

Table 7.17 Fabric groups and total number of Choiseul sherds analysed macroscopically.

Site	CA	Fmg	Fmg/Light	Fmg Hybrid	Light	Total	Assemb. Proportion
Nuatambu	-	164	21	47	13	245	35%
Sao	-	2	-	-	-	2	100%
Laena Island	-	182	86	11	21	300	32%
Wagina	-	178	85	4	11	278	25%

The stratigraphic distribution of fabric types identified from diagnostic sherds recovered in Miller's (1979) excavation carried out on Nuatambu exhibited a similar pattern with Fmg being the most dominant fabric, followed by Fmg Hybrid (Table 7.18). As was the case for the excavated Sikopo sample, Light fabric sherds were only identified in the upper layers. Taking into account the small sample sizes of these assemblages, this suggests that quartz and plagioclase feldspar-rich fillers were used in pottery-making in the region more recently in time. Whereas the remaining fabric types appear to have been used more consistently throughout Nuatambu's occupation.

Table 7.18 Stratigraphic distribution of fabric groups identified from Nuatambu pottery.

Layer	Fmg	Fmg/Light	Fmg Hybrid	Light	Count
C	18	3	3	10	34
D	2	-	2	-	4
E	5	-	6	1	12
F	2	1	2	-	5
G	8	2	8	-	18
H	6	2	5	-	13
J	38	3	7	-	48
Total	79	11	33	11	134
% of sample	59	8	25	8	100

7.5.2 Mineralogy

Tables 7.20 to 7.26 summarise the types of inclusions identified in the Choiseul sherds along with their stratigraphic context, vessel form and fabric group. Nuatambu and Sao sherds are listed in Tables 7.20 to 7.22. These are followed by the Laena Island samples in Tables 7.23 and 7.24, and Wagina samples in Tables 7.25 and 7.26. These are presented at the end of this section. Below, Table 7.19 summarises the classification of the Choiseul samples into five major fabric groups and associated sub-groups identified following the SEM analysis. The mineral composition of these fabrics and their sub-groups is described below.

Table 7.19 Allocation of Choiseul SEM sherd samples into major fabric groups and sub-groups.

Fabric & Sub-groups	Nuatambu	Sao	Laena Island	Wagina	Count
Fmg	16	1	10	14	42
Amp	*8*	-	*2*	*3*	*13*
Amp/Lithic	*5*	*1*	*7*	*9*	*22*
Amp/Pyrx/Fe ox	*3*	-	-	*2*	*5*
Pyrx/Fe ox	-	-	*1*	-	*1*
Fmg Hybrid	2	-	2	1	4
Light	2	-	3	2	7
Plag	*1*	-	*2*	-	*3*
Plag/Qtz	*1*	-	*1*	*1*	*3*
Qtz	-	-	-	*1*	*1*
Fmg/Light	1	-	2	1	4
Amp/Plag/Qtz/Lithic	*1*	-	*2*	-	*3*
Amp/Plag/Pyrx	-	-	-	*1*	*1*
Lithic	-	1	1	-	2
Total	21	2	18	18	59

Fmg

Calcic amphiboles, specifically actinolite and hornblendes, were the most common mineral components of the Choiseul Fmg sherds. The actinolite were typically sub-rounded to sub-angular while hornblendes were customarily prismatic in shape. The grains ranged in size between fine (<0.1 mm) to medium (0.1-2 mm), although occasionally some were near coarse (>2 mm). Particularly large hornblendes appeared characteristic for some of the Nuatambu Fmg sherds. Additionally, in contrast to the Laena Island and Wagina assemblages, some of the Nuatambu Fmg sherds contained minor amounts of calcareous reef detritus suggesting derivation from volcanic beach deposits.

Four Fmg sub-groups were identified: an amphibole-rich group, an amphibole and lithic blend, an amphibole/clinopyroxene/iron oxide blend, and a clinopyroxene and iron oxide blend. Most of the Nuatambu Fmg samples grouped in the amphibole-rich fabric. In contrast, the amphibole and lithic blend was the most dominant sub-group for the Laena Island and Wagina Fmg samples (Table 7.19).

The amphibole-rich fabric and amphibole/lithic blend were similar apart from sherds grouping in the latter possessing an equal abundance of lithics and amphiboles (Figure 7.18). Actinolite and hornblendes, specifically magnesio-hornblende and alumino-tschermakite, were commonplace for all the Choiseul samples. The only noticeable differences between the assemblages were the Nuatambu sherds containing minor amounts of calcareous inclusions, lower amounts of epidote and a higher proportion of igneous and sedimentary clasts. The igneous fragments were typically composed of iron oxide-oligoclase-andesine-ferro-actinolite-titanite-ilmenite and the sedimentary conglomerates of albite-ferro-actinolite-augite-oligoclase. The Laena Island and Wagina assemblages, conversely, contained close to zero calcareous inclusions plus higher proportions of epidote and metamorphic lithic fragments. These lithic fragments were most commonly composed of quartz-albite-epidote-ferro-actinolite-gedrite-iron oxide-titanite or albite-augite-gedrite.

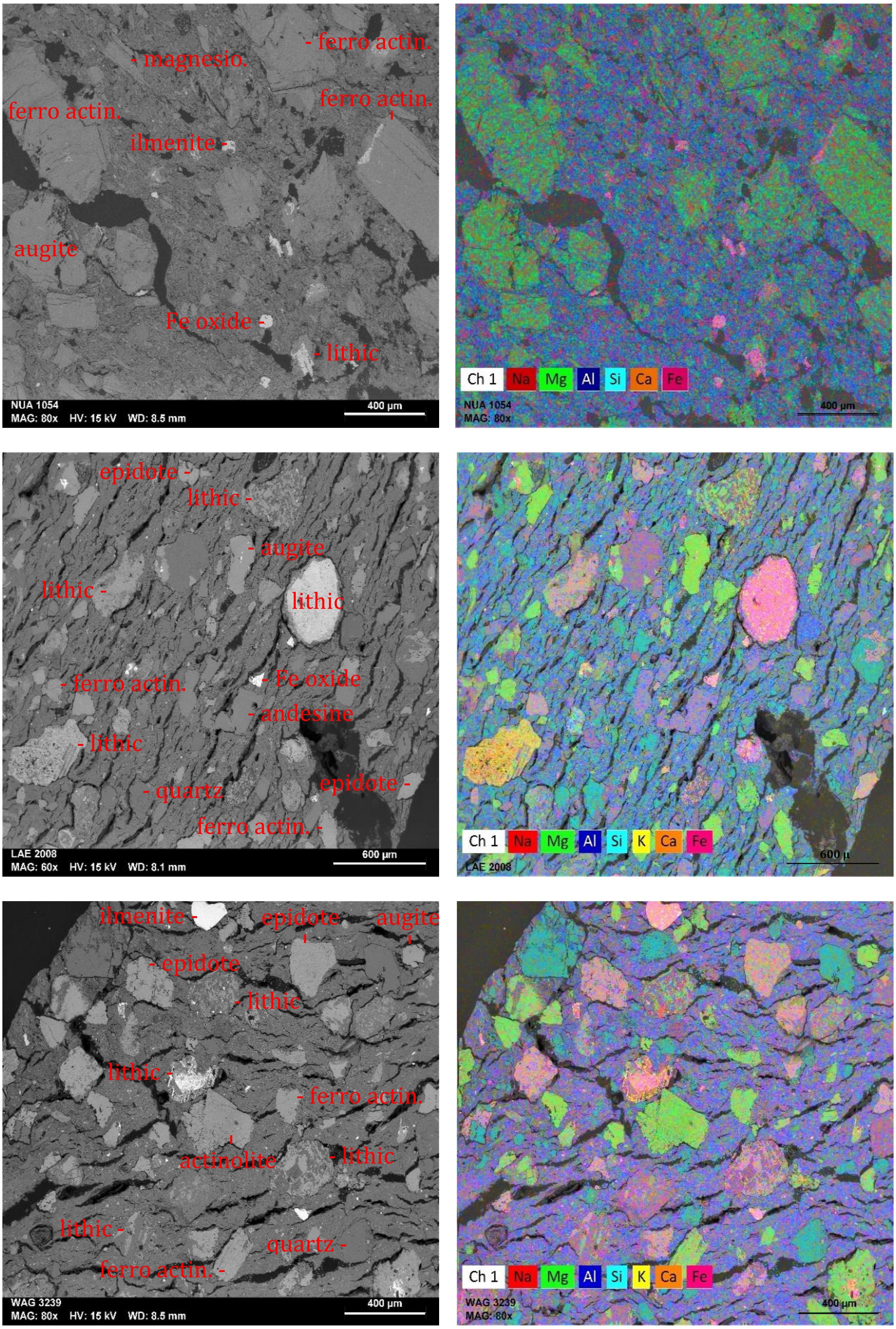


Figure 7.18 Choiseul Fmg fabric sub-groups: amphibole-rich group (top row) and amphibole/lithic blend (middle and bottom rows).

Sherds grouped in the amphibole/clinopyroxene/iron oxide blend and clinopyroxene/iron oxide blend contained proportions of clinopyroxene, namely augite, and iron oxides that were at least equal to the number of amphiboles (Figure 7.19). One of these sherds, LAE 4009, was grouped on its own in the clinopyroxene/iron oxide sub-group as it contained an abnormally low amount of amphiboles and was dominated by augite, pigeonite and iron oxides. The fabric of the sherd was particularly well-sorted and resembled the fabric identified from the sherd found on a shrine on Sikopo which was characterised to New Georgia. Although, no olivine was detected which may suggest it was originally manufactured in Kolombangara where a similar pyroxenic fabric has been identified (Findlater *et al.* 2009: 104).

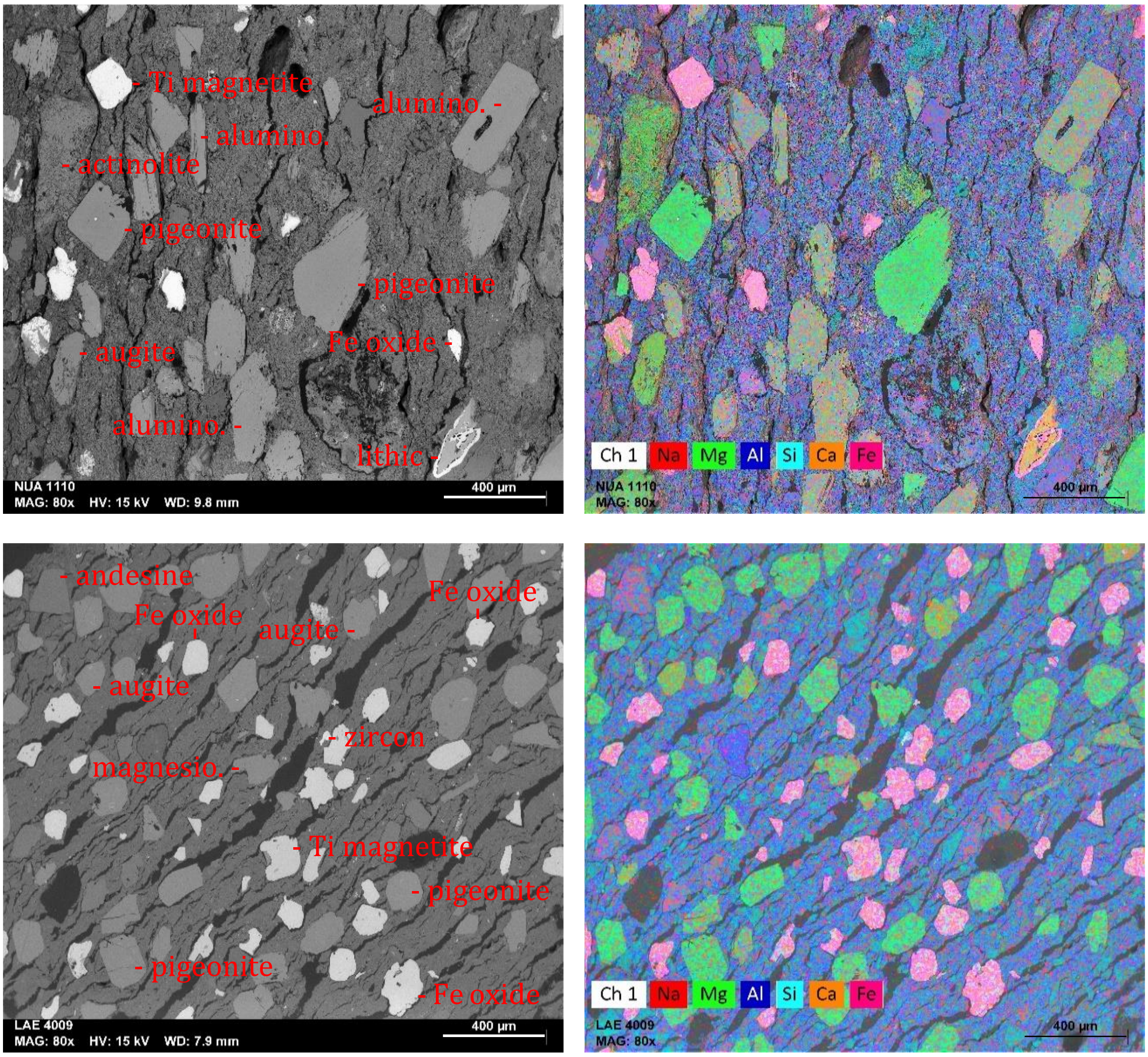


Figure 7.19 Choiseul Fmg fabric sub-groups (ctd.): amphibole/clinopyrx./iron oxide blend (top row) and clinopyx./iron oxide blend (bottom row).

Fmg Hybrid

Fmg Hybrid sherds were characterised by a dominant amount of actinolite and hornblendes as well as large (1-5 mm) white inclusions that were visible to the naked eye in cross section (Figure 7.20). SEM analysis of these inclusions demonstrated them to be chemically characteristic of a clay silicate such as beidellite – high in Si (~60%) and Al (~25%) and low in Mg (~3%) and Ca (~3%) – or some other clay mineral high in Si (~50%), Al (~30%) and Ca (~15%). These inclusions also typically contained small amounts of minutely sized (1-3 µ) hornblendes, plagioclase and iron oxide.

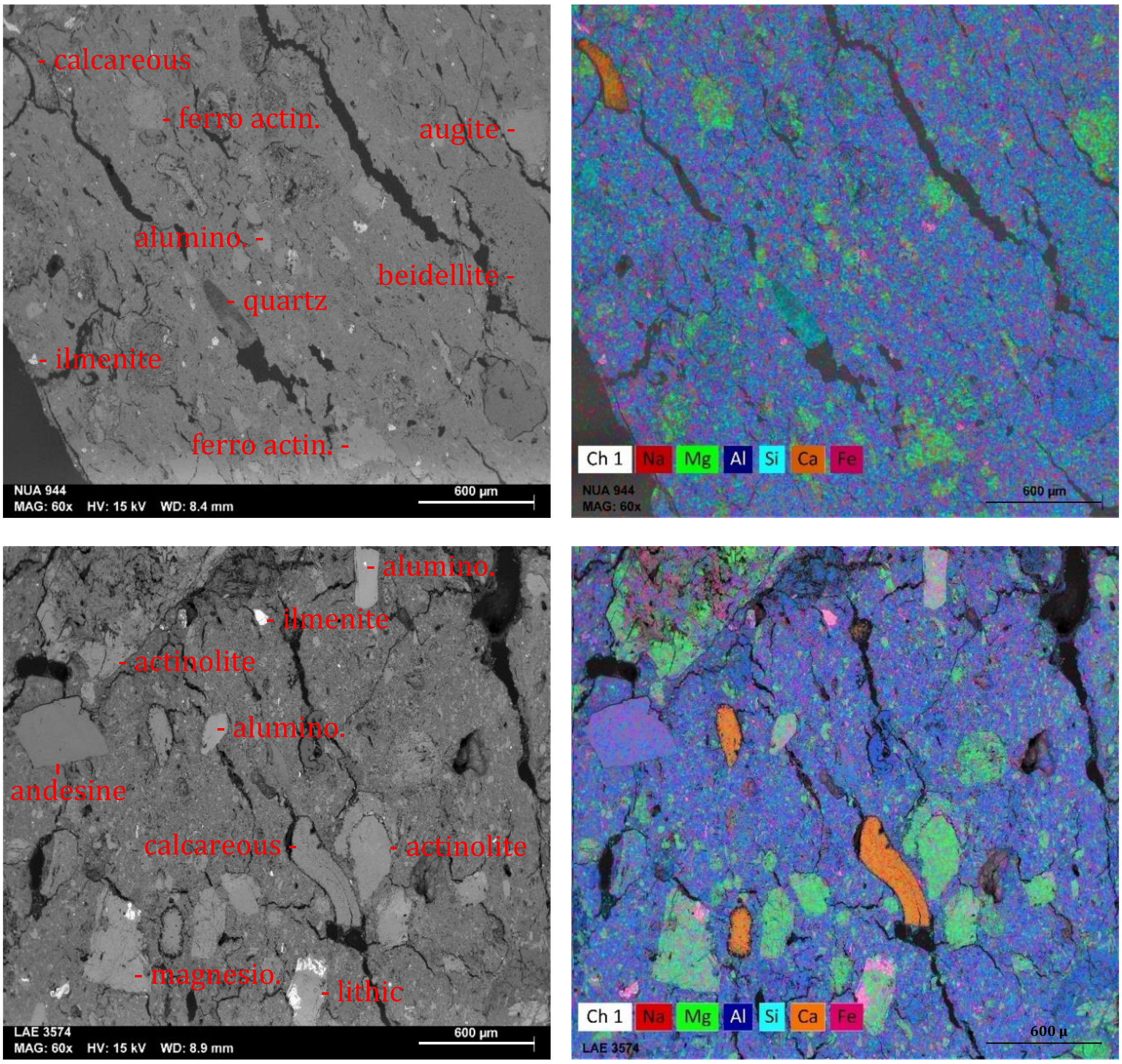


Figure 7.20 Choiseul Fmg Hybrid fabric. Electron micrographs (left) and map scans (right) of sherds NUA 944 (top row) and LAE 3574 (bottom row).

Light

Plagioclase feldspars and quartz were the most common mineral constituents for the Light fabric (Figure 7.21). The Laena Island and Wagina sherds contained some grains that were coarse in size although they were more often medium-sized (0.1-2.2 mm).

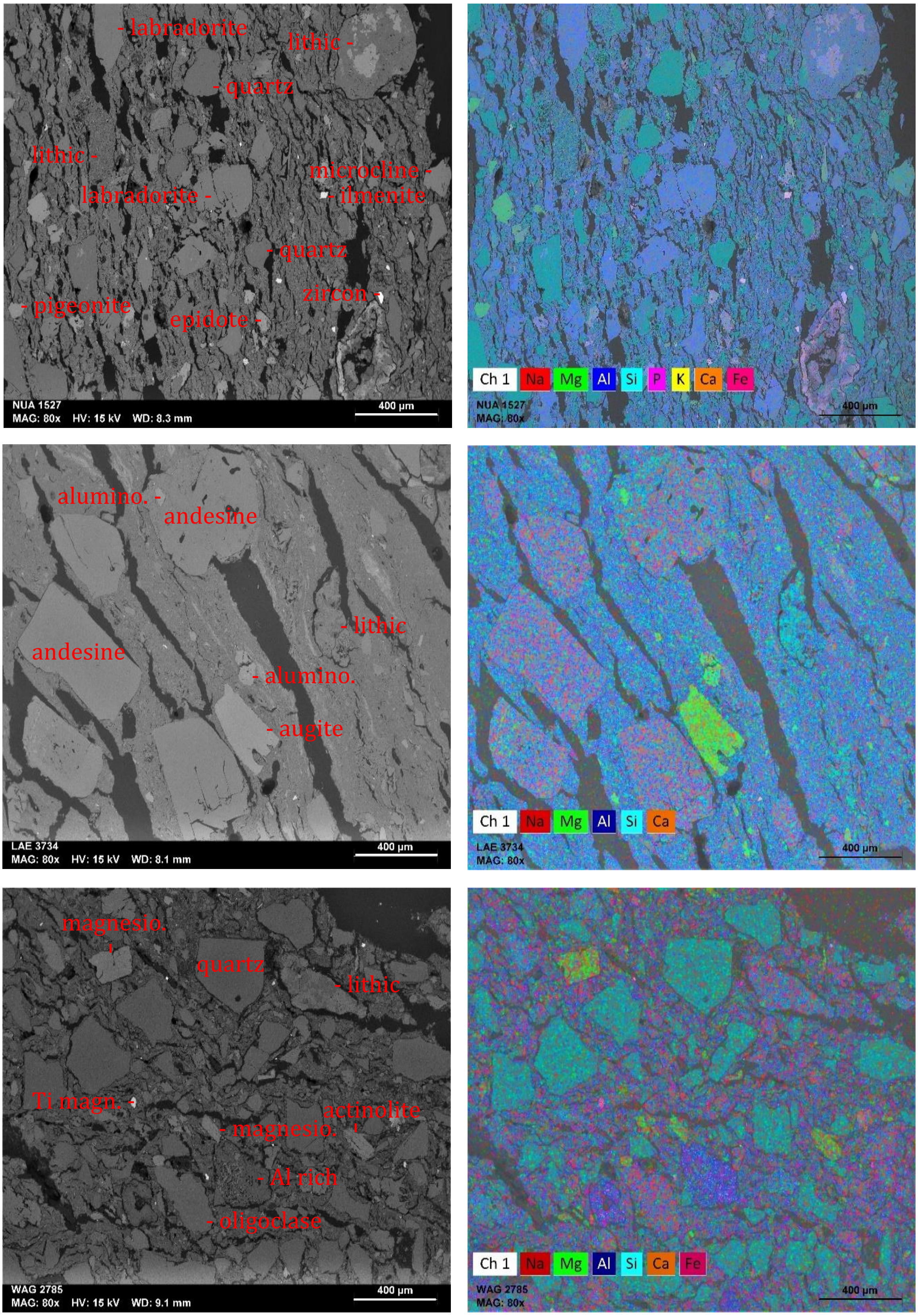


Figure 7.21 Choiseul Light fabric. Electron micrographs (left) and map scans (right) of sherds NUA 1527 (top row), LAE 3734 (middle row) and WAG 2785 (bottom row).

These sherds typically contained minor amounts of amphiboles, clinopyroxene, alkali feldspars, iron oxides, ilmenite, titanium magnetite, epidote and metamorphic clasts. The Nuatambu sherds contained metamorphic lithic fragments composed mainly of ferro-actinolite-oligoclase-titanite-iron oxide as well as sedimentary conglomerates containing ferro-actinolite and ilmenite. While the metamorphic fragments identified in the Wagina sherds were composed of albite, quartz, epidote, microcline or orthoclase, and titanite or chromite. Metamorphic lithic fragments identified in the Laena Island Light sherds were compositionally similar to the Wagina samples, and these sherds also contained igneous clasts composed of andesine-augite-hornblende or gedrite-iron oxide-quartz.

Fmg/Light

The Fmg/Light sherds contained an equal abundance of amphiboles, lithics and plagioclase (Figure 7.22). Specifically, there were typically high proportions of actinolite, hornblende, lithic fragments and plagioclase feldspars, namely andesine and oligoclase. The single Nuatambu Fmg/Light sherd, the possible late Lapita sherd (NUA 1547), was unique from the others as it contained minor amounts of calcareous inclusions. Metamorphic clasts with compositions of albite/oligoclase-ferro-actinolite-titanite-iron oxide or epidote-oligoclase-orthoclase-gedrite-titanite were the most common lithic fragments for this fabric. Although igneous fragments possessing similar compositions but with augite were also identified, and the Nuatambu sherd also contained sedimentary conglomerates composed mainly of augite and gedrite.

Lithic

Only two sherds were dominated almost exclusively by lithic fragments, one from Laena Island and the other from Sao (Figure 7.23). LAE 3769 contained both igneous and metamorphic lithic fragments, as well as lesser amounts of clinopyroxene, amphiboles and iron oxides. The igneous fragments were typically composed of ferroan pigeonite-iron oxide-ilmenite-albite-quartz or gedrite-albite-orthoclase. While the metamorphic fragments were composed of quartz-gedrite-albite-oligoclase/andesine or gedrite-oligoclase-titanite-iron oxide-augite. SAO 2091 contained a high proportion of both lithic fragments and ilmenite. Most of the fragments appeared metamorphic and were typically composed of epidote, quartz, oligoclase and sometimes titanite and iron oxide. This was characteristic of ilmenite-rich metamorphic fragments identified in the local riverine sand samples collected at Piripea River, located less than a kilometre south of Sao.

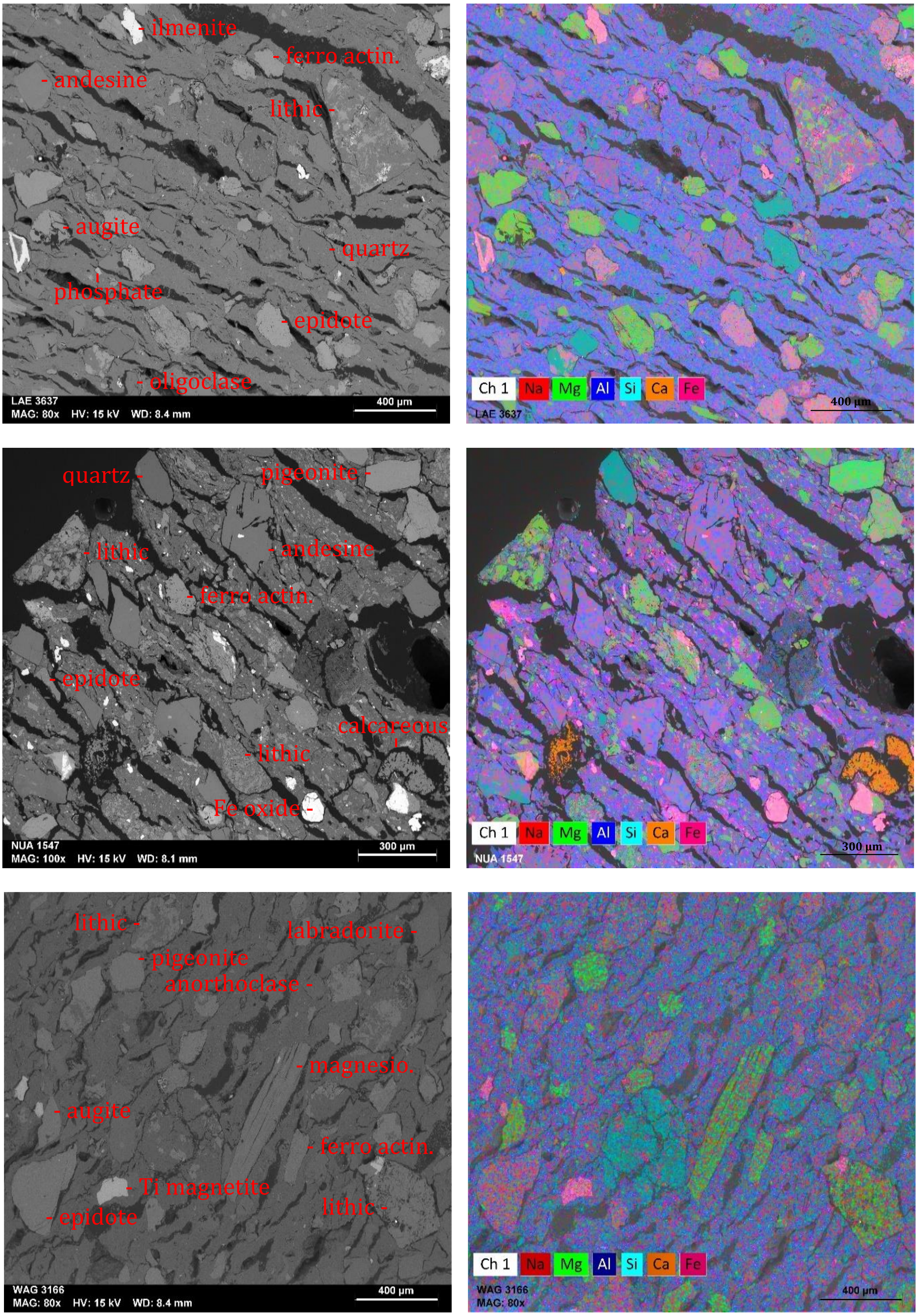


Figure 7.22 Choiseul Fmg/Light fabric. Electron micrographs (left) and map scans (right) of sherds LAE 3637 (top row), NUA 1547 (middle row) and WAG 3166 (bottom row).

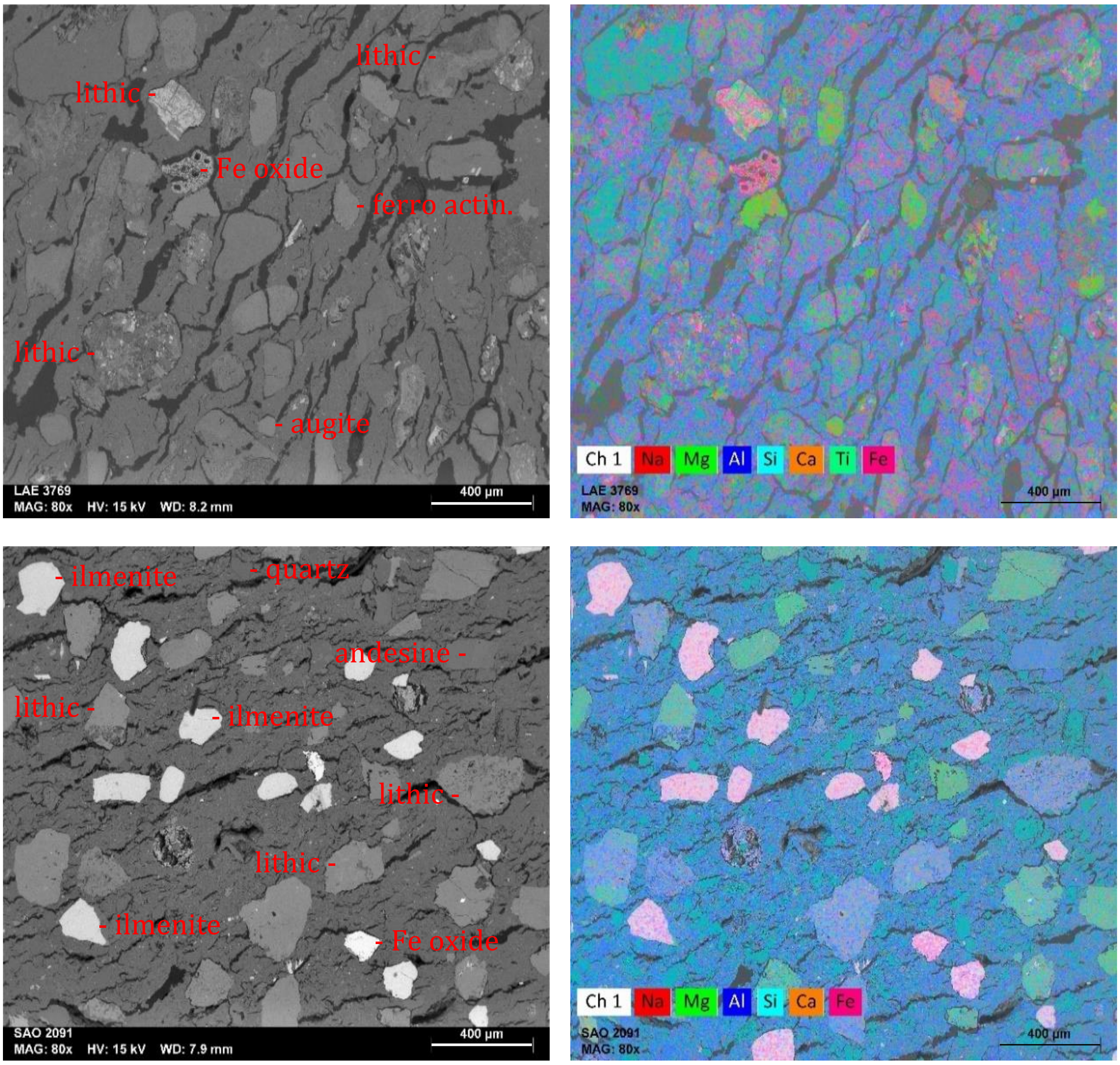


Figure 7.23 Choiseul Lithic fabric. Electron micrographs (left) and map scans (right) of sherds LAE 3769 (top row) and SAO 2091 (bottom row).

Table 7.20 SEM identifications of inclusions in excavated Nuatambu samples.

	Sherd	869	912	913	944	993	1022
	Layer	C	C	C	D	G	H
	Vessel Form	VI	II	-	VI	II	VI
	Fabric	Light	Fmg	Fmg	Fmg H.	Fmg	Fmg
Calcareous	Coral/shell detr.				X		X
Amphiboles	Cummingtonite						X
	Tremolite						
	Actinolite					X	
	Ferro-actinolite	X	X	X	X	X	X
	Magnesio-horn.	X	X	X		X	
	Edenite						
	Alumino-tsch.		X		X	X	X
	Kaersutite						
	Gedrite		X				
Clinopyroxene	Pigeonite						
	Augite	X	X	X	X		
	Ferroan augite						
	Indeterminate						
Plagioclase	Albite	X	X	X			
	Oligoclase	X	X	X	X	X	
	Andesine	X	X		X	X	X
	Labradorite	X		X			X
	Bytownite		X				
	Anorthite				X		
Alkali feldsp.	Anorthoclase						
	Orthoclase		X	X			
	Microcline		X				
	Sanidine						
Epidote	Epidote	X	X				
Quartz	Quartz	X	X	X	X		
Non-Silicates	Ilmenite	X	X	X	X	X	X
	Iron oxide	X	X	X	X	X	X
	Ulvospinel	X		X	X	X	X
	Titanite	X					
	Rutile?						
Other	Lithic	X	X	X	X	X	X
	Garnet?						
	Beidellite?				X		
	Al-rich incls.			X			

Table 7.21 SEM identifications of inclusions in excavated Nuatambu samples (ctd).

	Sherd	1043	1044	1054	1070	1110	1133	1139
	Layer	J	J	J	J	J	J	J
	Vessel Form	Disc	VI	VI	VI	-	VI	VI
	Fabric	Fmg	Fmg H.	Fmg	Fmg	Fmg	Fmg	Fmg
Calcareous	Coral/shell detr.		X		X			
Amphiboles	Cummingtonite	X						
	Tremolite							
	Actinolite			X	X	X		
	Ferro-actinolite		X				X	
	Magnesio-horn.	X		X			X	X
	Edenite			X				
	Alumino-tsch.	X	X			X		X
	Kaersutite							
	Gedrite							
Clinopyroxene	Pigeonite					X		
	Augite			X		X	X	X
	Ferroan augite							
	Indeterminate							
Plagioclase	Albite					X		
	Oligoclase		X		X	X		
	Andesine	X	X	X		X		X
	Labradorite		X					
	Bytownite							
	Anorthite							
Alkali feldsp.	Anorthoclase							
	Orthoclase	X	X					
	Microcline				X			
	Sanidine							
Epidote	Epidote	X					X	X
Quartz	Quartz				X			X
Non-Silicates	Ilmenite		X	X	X		X	X
	Iron oxide	X	X	X		X	X	
	Ulvospinel	X		X	X			X
	Titanite				X	X		
	Rutile?	X						
Other	Lithic	X	X	X	X	X	X	X
	Garnet?							X
	Beidellite?		X					
	Al-rich incls.							

Table 7.22 SEM identifications of inclusions in surface Nuatambu and Sao samples.

		Nuatambu								**Sao**	
	Sherd	1557	1369	1370	1511	1173	1216	1547	1527	2090	2091
	Vessel Form	VI	VI	VI	V	VI	VI	-	-	-	-
	Fabric	Fmg	Fmg	Fmg	Fmg	Fmg	Fmg	F/L	Light	Fmg	Fmg
Calcareous	Coral/shell detr.				X			X			
Amphiboles	Cummingtonite	X							X	X	X
	Tremolite										
	Actinolite			X							
	Ferro-actinolite					X	X			X	
	Magnesio-horn.	X	X	X	X	X	X	X	X	X	
	Edenite										
	Alumino-tsch.	X	X	X	X	X			X	X	X
	Kaersutite										
	Gedrite						X	X		X	
	Indeterminate									X	
Clinopyroxene	Pigeonite						X				
	Augite		X		X	X	X				X
	Ferroan augite										
	Indeterminate										
Plagioclase	Albite					X					X
	Oligoclase				X	X		X	X		
	Andesine	X				X	X				X
	Labradorite	X	X		X				X	X	
	Bytownite				X						
	Anorthite										
Alkali feldsp.	Anorthoclase			X	X			X			
	Orthoclase	X							X		X
	Microcline					X	X		X		
	Sanidine						X		X		
Epidote	Epidote	X					X	X	X	X	X
Quartz	Quartz	X			X	X	X	X	X	X	X
Non-Silicates	Ilmenite	X	X	X	X	X			X	X	X
	Iron oxide	X		X	X		X	X	X	X	X
	Ulvospinel	X	X		X	X	X	X		X	X
	Titanite										
	Zircon								X		
Other	Lithic	X	X	X	X	X	X	X	X	X	X
	Garnet?										

Table 7.23 SEM identifications of inclusions in excavated and surface Laena Island samples.

	Sherd	3371	4009	3734	1593	3449	1605	3455	2010	2008	1675
	Layer	1	3	3	-	-	-	-	-	-	-
	Vessel Form	I	IV	IV	II	IV	II	IV	II	IV	-
	Fabric	Fmg	Fmg	Light	Light	Light	F/L	F/L	Fmg	Fmg	Fmg
Calcareous	Coral/shell detr.										
Amphiboles	Cummingtonite					X					
	Tremolite										
	Actinolite						X				X
	Ferro-actinolite						X	X	X	X	X
	Magnesio-horn.	X	X		X	X	X	X	X		X
	Edenite										
	Alumino-tsch.	X		X			X		X		
	Kaersutite										
	Gedrite										
	Indeterminate									X	
Clinopyroxene	Pigeonite		X					X			
	Ferroan pigeon.										X
	Augite	X	X	X		X	X		X	X	X
	Ferroan augite										
	Indeterminate										
Plagioclase	Albite	X					X	X	X	X	X
	Oligoclase	X					X	X	X	X	X
	Andesine	X	X	X	X	X	X	X	X	X	X
	Labradorite			X	X	X		X		X	
	Bytownite										
	Anorthite										
	Indeterminate										
Alkali feldsp.	Anorthoclase										
	Orthoclase	X				X	X	X	X		
	Microcline									X	
	Sanidine			X	X						
	Indeterminate										
Epidote	Epidote	X				X		X	X	X	X
Quartz	Quartz	X	X	X	X	X	X	X	X	X	X
Non-Silicates	Ilmenite					X	X		X	X	X
	Iron oxide	X	X	X	X	X	X		X	X	X
	Ulvospinel		X		X			X	X		X
	Titanite	X					X			X	
	Zircon		X							X	
	Phosp. (apatite)	X									
Other	Lithic	X	X	X	X	X	X	X	X	X	X
	Garnet										
	Al-rich incls.									X	

Table 7.24 SEM identifications of inclusions in surface Laena Island samples.

	Sherd	3637	3412	1698	3433	3574	3576	3524	3769
	Vessel Form	IV	IV	VI	VI	VI	VI	-	-
	Fabric	F/L	Fmg	Fmg	Fmg	Fmg H.	Fmg H.	Fmg	Lithic
Calcareous	Coral/shell detr.					X			
Amphiboles	Cummingtonite								
	Tremolite								
	Actinolite			X		X	X	X	
	Ferro-actinolite	X	X	X	X	X	X	X	X
	Magnesio-horn.	X				X	X		
	Edenite								
	Alumino-tsch.			X	X	X	X		
	Kaersutite								
	Gedrite				X		X	X	X
	Indeterminate		X						
Clinopyroxene	Pigeonite								
	Ferroan pigeon.		X						
	Augite	X		X	X		X	X	X
	Ferroan augite								
	Indeterminate								
Plagioclase	Albite	X	X	X	X		X	X	X
	Oligoclase	X	X	X	X		X		
	Andesine	X	X	X	X	X	X		
	Labradorite	X	X	X	X		X		
	Bytownite	X							
	Anorthite								
	Indeterminate				X				
Alkali feldsp.	Anorthoclase			X		X			
	Orthoclase				X	X			
	Microcline								
	Sanidine	X							
	Indeterminate				X				
Epidote	Epidote	X	X	X	X		X	X	X
Quartz	Quartz	X	X	X	X			X	X
Non-Silicates	Ilmenite	X	X	X	X	X	X	X	X
	Iron oxide		X	X				X	X
	Ulvospinel	X		X	X		X		
	Titanite						X		
	Zircon			X					
	Phosphate	X							
	Rutile?								X
Other	Lithic	X	X	X	X	X	X	X	X
	Garnet								
	Al-rich incls.								

Table 7.25 SEM identifications of inclusions in Wagina samples.

	Sherd	2927	3281	3239	3270	2319	2085	3170	3168	3211
	Vessel Form	II	II	IV	IV	VI	IV	-	-	-
	Fabric	Fmg	Fmg	Fmg	Fmg	Fmg	Fmg	Fmg	Fmg	Fmg H.
Calcareous	Coral/shell detr.									
Amphiboles	Cummingtonite									
	Actinolite					X				X
	Ferro-actinolite	X	X	X	X	X	X		X	X
	Magnesio-horn.	X	X	X		X	X	X	X	
	Edenite									
	Alumino-tsch.	X				X				X
	Kaersutite									
	Gedrite						X			
	Indeterminate								X	
Clinopyroxene	Pigeonite	X								
	Ferroan pigeon.									
	Augite	X	X	X	X	X	X	X	X	X
	Ferroan augite									
	Indeterminate									
Plagioclase	Albite	X	X	X	X		X	X	X	
	Oligoclase	X	X	X	X		X	X	X	
	Andesine	X	X		X	X		X	X	X
	Labradorite	X	X		X		X			
	Bytownite									
	Anorthite									
	Indeterminate									
Alkali feldsp.	Anorthoclase		X	X			X			
	Orthoclase		X	X	X		X	X		
	Microcline		X							
	Sanidine									
	Indeterminate					X				
Epidote	Epidote	X	X	X	X		X		X	
Quartz	Quartz	X	X	X	X		X	X	X	
Non-Silicates	Ilmenite	X	X	X	X	X	X		X	X
	Iron oxide	X	X	X				X	X	X
	Ulvospinel				X			X	X	
	Phosp. (apatite)									
	Rutile?	X								
	Chromite	X								
	Titanite									
Other	Lithic	X	X	X	X	X	X	X	X	X
	Garnet									
	Al-rich incls.	X				X				X

Table 7.26 SEM identifications of inclusions in Wagina samples (ctd).

	Sherd	2056	3166	2534	2785	2917	3130	2455	2529	2743
	Vessel Form	IV	VI	IV	-	VI	IV	IV	IV	VI
	Fabric	F/L	F/L	Light	Light	Fmg	Fmg	Fmg	Fmg	Fmg
Calcareous	Coral/shell detr.									
Amphiboles	Cummingtonite									
	Actinolite				X					X
	Ferro-actinolite	X	X		X	X	X	X	X	X
	Magnesio-horn.	X	X	X	X	X		X	X	X
	Edenite									
	Alumino-tsch.							X		X
	Kaersutite									
	Gedrite	X	X			X			X	
	Indeterminate									
Clinopyroxene	Pigeonite		X	X		X				X
	Ferroan pigeon.						X			
	Augite	X	X	X		X		X	X	X
	Ferroan augite									X
	Indeterminate									
Plagioclase	Albite	X		X	X	X	X	X	X	
	Oligoclase	X	X	X	X	X	X	X		
	Andesine			X	X	X	X	X	X	X
	Labradorite		X	X		X				
	Bytownite			X						
	Anorthite									
	Indeterminate					X				
Alkali feldsp.	Anorthoclase		X					X		
	Orthoclase		X		X					
	Microcline			X	X					
	Sanidine									
	Indeterminate									
Epidote	Epidote	X	X	X	X	X	X	X	X	
Quartz	Quartz	X	X	X	X	X	X	X	X	
Non-Silicates	Ilmenite	X	X	X		X	X	X	X	
	Iron oxide		X				X	X	X	X
	Ulvospinel	X	X	X		X	X			X
	Phosp. (francolite)									X
	Titanite			X						
Other	Lithic	X	X	X	X	X	X	X	X	X
	Garnet									
	Al-rich incls.					X			X	
	Ca-rich incl.						X			

7.5.3 Ceramic matrix

The clay chemical data of the Choiseul pottery and two clay samples collected on Wagina demonstrated that it was unlikely that these clay sources were used in the manufacture of any of the archaeological samples. The first PCA (Figure 7.24), which accounted for 87.8% of the variation, clearly separated the clay samples from the archaeological pottery on the second axis based on the absence of Na detected in the Wagina clay samples (Table 7.27). Other PCAs were run comparing the clay samples against the entire assemblage as well as only the Wagina samples and these consistently clustered the clay samples separately from the sherds. Only once Na was excluded did the clay samples cluster more closely with the archaeological samples. It was considered counter-productive to exclude Na, however, as it proved to be an important variable in the chemical clay grouping of pottery throughout this study.

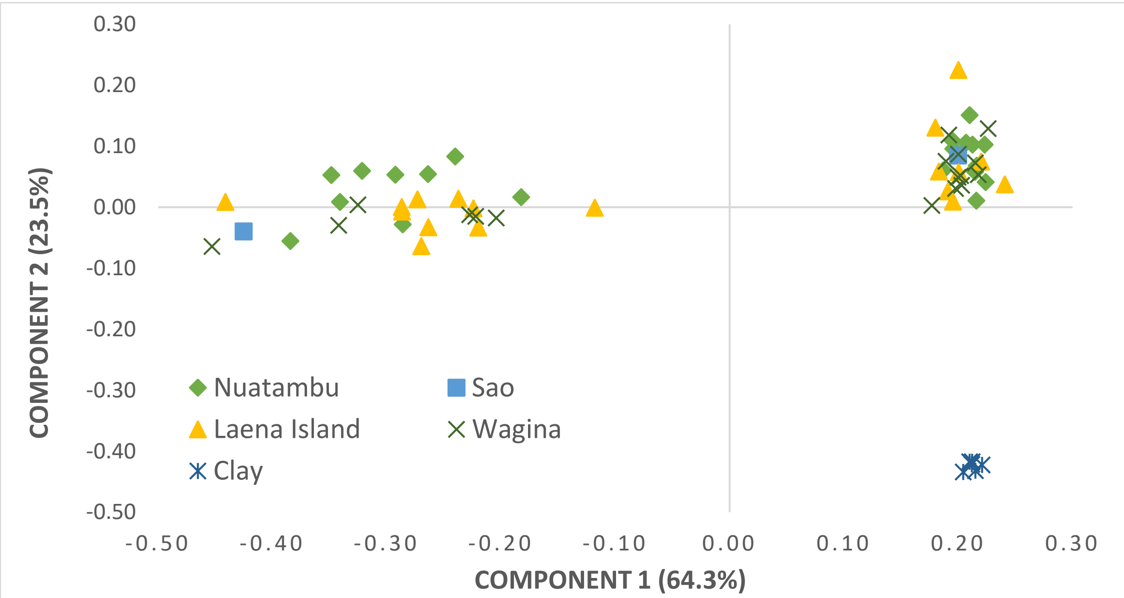


Figure 7.24 PCA 1: scatter plot of Components 1 and 2 of Choiseul pottery and Wagina clay samples.

Two more PCAs were carried out on the pottery alone, one including K and another without it, and these demonstrated some evidence of clustering between the sites. As was the case for the Arnavons pottery, K proved to be the strongest variable in the clustering behaviour of the Choiseul samples. In Figures 7.25 and 7.26, sherds clustering to the far right of the scatter plots contained K while those on the left contained none. Noticeably, the two sherds from Sao are separated and this is considered unlikely to depict a realistic grouping. From the mineralogical evidence, it is considered likely the Sao sherds were made using the same clay source and should cluster together.

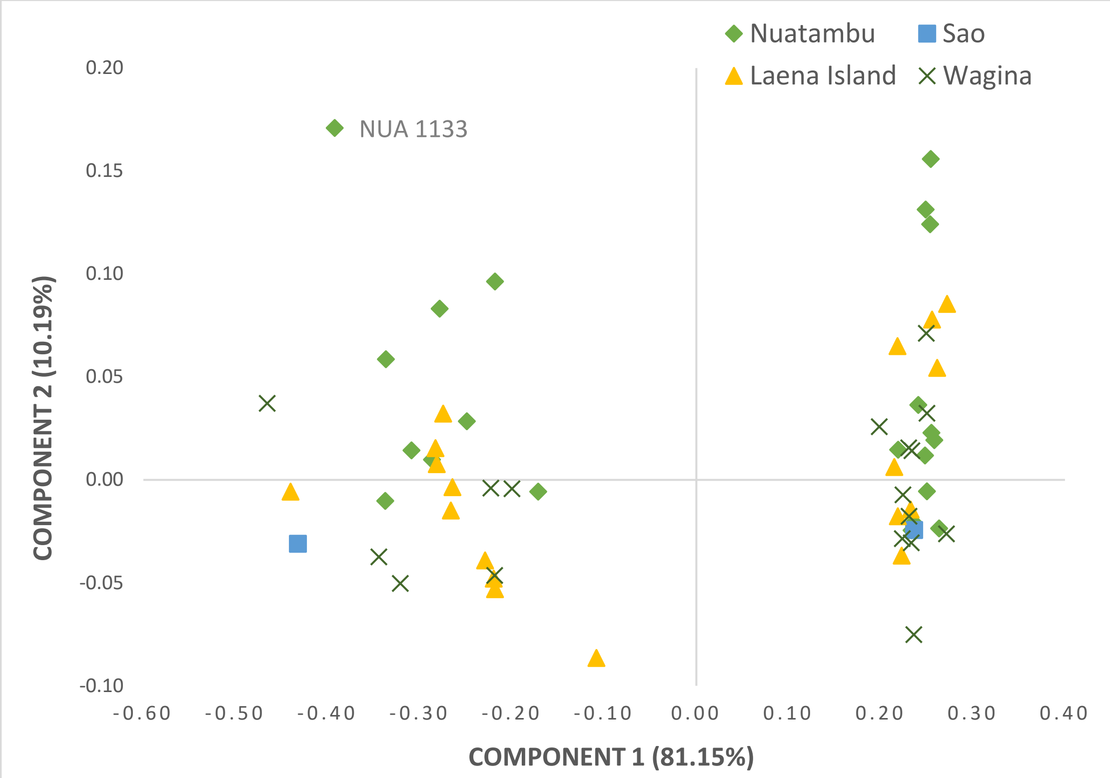


Figure 7.25 PCA 2: scatter plot of Components 1 and 2 of Choiseul pottery with K.

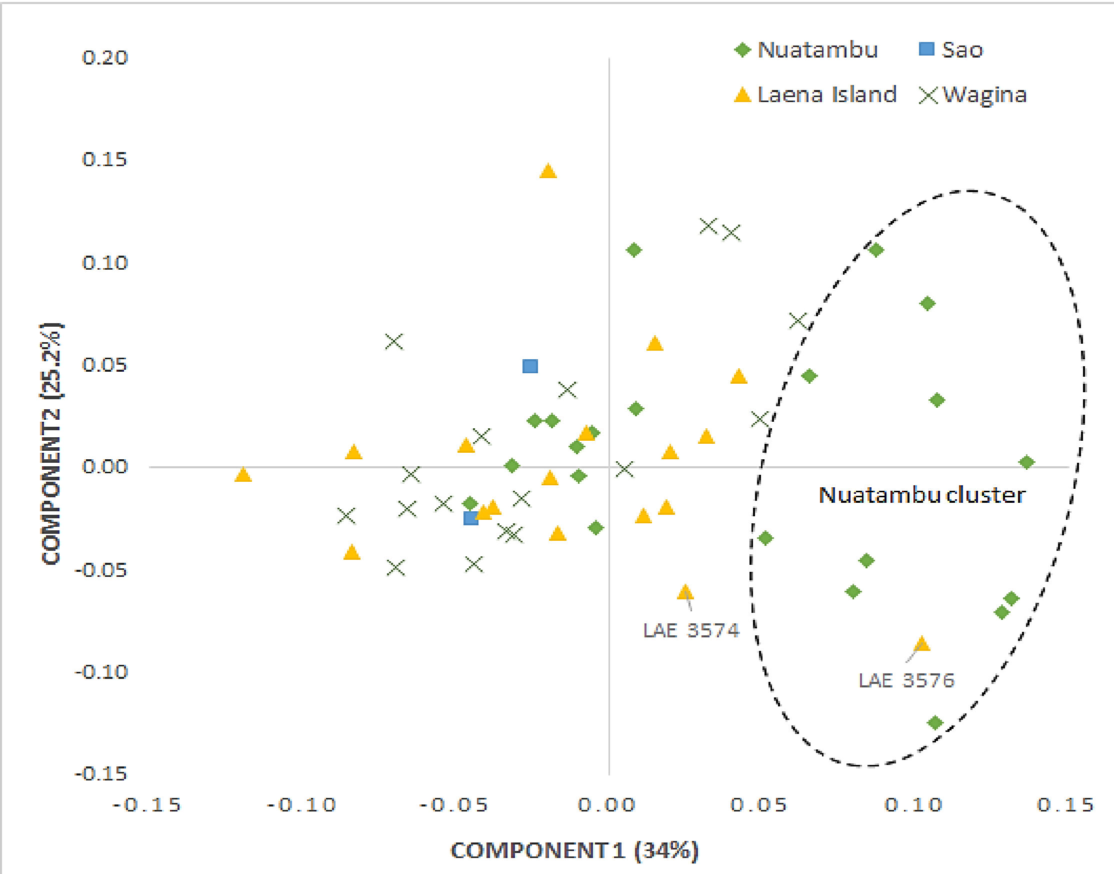


Figure 7.26 PCA 3: scatter plot of Components 1 and 2 of Choiseul pottery without K.

Potassium was excluded in the running of the third PCA (Figure 7.26) and in the HCA (Figure 7.27), and these analyses demonstrated evidence of half of the Nuatambu pottery clustering separately from the Laena Island, Wagina and Sao pottery. This PCA accounted for 59.2% of the variation and sherds within the 'Nuatambu cluster' were characterised by slightly higher than average levels of Na and Mg than the rest of the Choiseul pottery (Table 7.27). This clustering pattern was expected under the assumption that the Nuatambu pottery was manufactured using clays local to the area while the Laena Island, Wagina and Sao pottery were made using clays local to southeast Choiseul. The mineralogical evidence, specifically evidence of mineralogical distinctions between the Nuatambu fabrics and those characterising the Laena Island and Wagina fabrics, provide support for local clay procurement.

Table 7.27 Variable loadings for PCA analyses of Choiseul ceramic matrices and clay samples.

Element	PCA 1		PCA 2		PCA 3	
	Comp. 1	*Comp. 2*	*Comp. 1*	*Comp. 2*	*Comp. 1*	*Comp. 2*
Na2O	-0.13	1.07	0.17	-0.08	0.24	0.02
MgO	0.32	-0.33	0.24	0.66	0.30	-0.10
Al2O3	0.32	-0.20	0.27	-0.17	-0.12	0.07
SiO2	0.30	-0.21	0.24	-0.09	-0.09	0.02
CaO	0.31	0.12	0.34	-0.04	-0.19	-0.30
TiO2	0.32	-0.11	0.29	-0.17	-0.08	0.23
FeO	0.37	-0.11	0.35	-0.09	-0.05	0.06
K2O	-1.81	-0.23	-1.90	-0.01	-	-

Notably, one Laena Island sherd with a Fmg Hybrid fabric, LAE 3576, plotted within the cluster and was also grouped in the dendrogram alongside some of the Nuatambu sherds. The sherd, along with another similar Fmg Hybrid vessel from Laena Island, LAE 3574, which also shared close stylistic similarities with the Nuatambu assemblage are considered likely to have been imported from Nuatambu. Evidence of the Fmg Hybrid fabric possibly being distinctive to Nuatambu is discussed further in section 7.6. Overall, apart from half of the Nuatambu sherds clustering on their own and evidence of the exchange of pots from Nuatambu to Laena Island, no other noticeable patterning was observed from the chemical clay data of the Choiseul pottery.

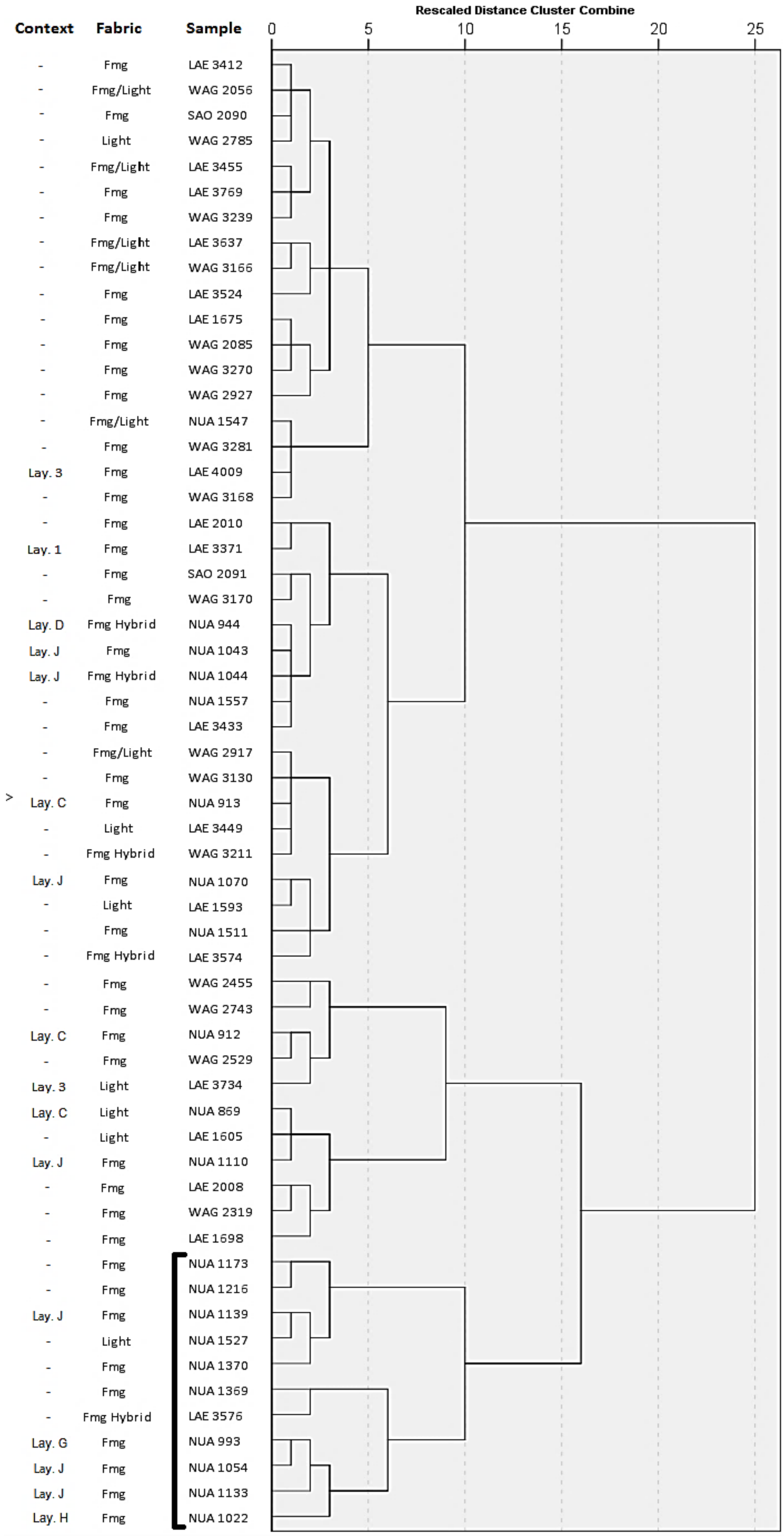


Figure 7.27 Dendrogram of Choiseul sherds using Wards Method (excluding K). Black line indicates sherds within 'Nuatambu cluster'.

7.6 Summary of Compositional Evidence and Conclusions

This chapter has explained the methodological procedure used in the compositional analysis of pottery collected from Manning Strait and presented results for each of the three main geographic regions under examination: Isabel, Arnavon Islands and Choiseul. For each region, an overview of the macroscopic fabric groupings was given. This was followed by summaries of the mineralogical content of these fabrics and chemical clustering of the pottery based on their ceramic matrices. In the rest of this summary, key findings will be raised from a comparison of the mineralogical variation and chemical groupings of the Manning Strait assemblages. Brief comparisons will also be made between these results and findings from other compositional studies of pottery documented in the Western and Northern Solomons concerning prehistoric pottery production and distribution patterns.

Overall, the Manning Strait pottery assemblages demonstrated a relatively narrow range of variation in the types of inclusions used in their manufacture. Volcanic beach placer sands and stream sands were the most dominant types of fillers, particularly for the Arnavons and Choiseul assemblages. Inclusions typically associated with these fillers included calcic amphiboles, plagioclase feldspars, quartz, lithic fragments namely of metamorphic or felsic character and lesser amounts of iron oxides, ilmenite, clinopyroxene and epidote. The most noticeable compositional difference between the assemblages was the almost exclusively calcareous fabric of the Papatura ceramics and the mainly ferromagnesian fabrics of the Choiseul and Arnavons assemblages. This difference mirrors a temporal and technological trend that has commonly been observed in Lapita sites in the Pacific whereby the use of calcareous sand tempers in pottery-making declined after first phases of occupation and the preference for terrigenous sand tempers grew over time (Specht 1969; Summerhayes 1997: 115; Kirch 1986: 37-38; Sand & Ouetcho 1993; Dickinson 2006: 10).

The mineralogical content of the four non-calcareous sherds identified in the Papatura assemblage and the four sherds from Kusira suggest that the fillers used in the making of the pottery from these two sites were exotic to northwest Isabel. The high proportion of volcanic minerals characterising these sherds, specifically plagioclase, quartz, iron oxide, clinopyroxene and hornblendes, suggest Choiseul as a likely source of their origin. Importantly, these results corroborate previous petrographic analysis carried out by Dickinson on Isabel pottery (Radclyffe and Carter in prep.). Comparing the Papatura and Kusira findings with other compositional studies of late Lapita (ca. 2700-

2000 BP) assemblages recovered in the New Georgia group (Felgate and Dickinson 2001; Felgate 2003; Ramezanian-Abhari 2004; Findlater *et al*. 2009; Buhring *et al.* 2014), it is demonstrated that terrigenous fillers, specifically volcanic placer sands and stream sands, appear to have been selected by potters more commonly during this period than calcareous marine beach sands. The Papatura assemblage, therefore, is portrayed as a slight deviation from the norm for late Lapita potting communities in the Western Solomons. Although when compared to other middle to late Lapita sites such as Sites DAF, DJQ and DES located on Sohano Island (Wickler 2001) and Lasigi (Site ELS) and Fissoa (Site ENX) (Garling 2017) located on New Ireland, calcareous inclusions dominating the pottery fabric has been depicted as conventional. Further comparisons between Papatura and late Lapita sites in the Western Solomons and further afield are made in Chapter 10.

The vast majority of the post-Lapita pottery recovered in the Manning Strait region, which dates to within the last millennium, was demonstrated to have been manufactured in Choiseul. As has previously been found petrographically (Dickinson & Shutler 2000; Dickinson 2006: 90-92, 2007, 2009), the Choiseul fabrics were typified by their close petrological and mineralogical similarities with calc-alkaline andesitic pyroclastic deposits that characterise most of the province. Findings from this study, however, contribute further insight into potentially differentiating between regional pottery manufacturing centres in Choiseul.

Two key differences were observed between the fabrics of the southeast Choiseul assemblages - Laena Island and Wagina - and the Nuatambu assemblage. One, the Laena Island and Wagina assemblages were characterised predominantly by metamorphic constituents, namely foliated lithic fragments rich in epidote, quartz and high-Si (>60%) plagioclase such as albite and oligoclase. This was characteristic of the metamorphic stream sands collected in Piripea River in southeast Choiseul which are associated with the Choiseul Schists formations (see geological overview in Chp. 3). The Nuatambu fabrics, conversely, exhibited a generally more volcanic-derived composition consisting of large masses of actinolite, hornblendes and prismatic plagioclase, and igneous volcanic clasts. Many of these clasts appeared characteristic of the Mt Maetambe-derived pyroclastic andesitic bedrock local to central Choiseul. Metamorphic lithic fragments were also commonly identified in the Nuatambu pottery although were typically not as rich in epidote.

The second difference was that minor amounts of calcareous grains appeared more commonly in the Nuatambu assemblage, whereas they were rarely or if not completely absent in the Laena Island and Wagina pottery. This indicates that sands, most likely beach derived, selected in the manufacture of pottery at Nuatambu contained higher proportions of shell and coral detritus than the fillers used in the making of most of the Laena Island, Wagina and Sikopo pottery. Furthermore, PCA and HCA testing carried out on the Choiseul assemblages demonstrated evidence of half of the Nuatambu assemblage clustering separately from the Laena Island and Wagina samples.

The Fmg Hybrid fabric, which was characterised mainly by ferromagnesian minerals as well as large (1-5 mm) white inclusions that were identified using the SEM to be beidellite or geochemically similar limestone or clay silicates, may be distinctive to Nuatambu. The large white inclusions may derive from clay deposits available at Nuatambu where there is underlying volcanic as well as nearby reef limestone and sedimentary bedrock. Stylistically, there were close similarities between the Fmg Hybrid sherds from Nuatambu and the smaller number found on Laena Island, Wagina and Sikopo. A few of these sherds analysed using the SEM, LAE 3574 and 3576, appeared very similar in composition to the Nuatambu sherds and are considered to have been originally manufactured there. This indicated that pottery exchange occurred between communities on Nuatambu and Laena Island as early as about 650 calBP. This exchange link is likely to depict the beginning or at least formed part of a strong cultural and historical relationship between these islands that was centred on the making of kesa and which was described to me by Rokoso and Nuatambu communities.

Importation of pottery into Manning Strait from the New Georgia group was most clearly demonstrated by a single plain vessel deposited on a coral mound shrine on Sikopo. The vessel was characterised by a distinct volcanic placer sand fabric that appeared well-sorted, was dominated by iron oxides and augite measuring 200-400 μ in size, and importantly contained minor amounts of olivine which were not detected in any of the other ceramics. This fabric closely resembled Ramezanian-Abhari's (2004: 54) mafic 'Fabric B' which was determined by SEM and petrographic analyses to be of local origin to Roviana Lagoon. This vessel, therefore, was most probably transported to the Arnavons in the last few centuries by a visiting Roviana head-hunting party known in oral tradition to have frequented the island group.

There was also evidence of possible importation of pottery from Kolombangara. Previous SEM analysis of pyroxenic sherds made locally on Kolombangara (Findlater *et al.* 2009: 104) illustrate close similarities with a single notched rim sherd found on Laena Island. The sherd, LAE 4009, contained an abnormally low amount of amphiboles and was rich in clinopyroxene and iron oxides. The nearby island of Vella Lavella, which also shared historical and exchange ties with Choiseul, is characterised by a hornblende-rich andesitic geological terrain similar to Choiseul. Further geochemical inspection of Vella Lavella pottery and both placer and riverine sand samples from the island would be required to examine the possibility of pottery found in the Manning Strait region deriving from pottery-making centres on Vella Lavella. Patterns of prehistoric interaction in Manning Strait are explored in more detail in the next chapter, but with a focus on evidence provided from technological and descriptive analyses of lithic artefacts collected during the fieldwork.

Chapter 8 Lithics

This chapter provides a summary of findings from a descriptive and technological analysis of lithic artefacts recovered in Manning Strait. It is divided into seven sections. The first provides an overview of the entire lithic assemblage and describes the sampling strategy undertaken in the collection of lithic artefacts. The second section summarises findings from an attribute analysis of the chert artefacts. The third section details the geochemical characterisation of a single obsidian flake recovered on the Arnavon Islands. Two groundstone tools collected on Wagina are described in the fourth section, and quartz artefacts found on Laena Island are described in the fifth. The sixth section is a brief summary of miscellaneous lithic artefacts recovered during surveying in Manning Strait, specifically pumice abraders and ochre. The chapter is concluded with a brief discussion about how key findings from the lithic analyses contribute towards expanding our understanding about technological and spatial patterns of stone tool manufacture in this part of the Western Solomons as well as the historical development of craft specialisation.

8.1 Overview of Manning Strait Assemblage

Sampling of lithic artefacts during excavation and surface surveys was targeted primarily at collecting chert. Ovenstone was the only lithic type that was left on site if found in abundance. Therefore, unlike the remainder of the assemblage, the proportion of ovenstone presented here is an underrepresentation of how much was found at the sites. By artefact count, chert comprised the bulk of the lithics collected from Manning Strait, followed by quartz and pumice (Table 8.1).

Table 8.1 Total number of lithics collected in Manning Strait per site and material type.

Assemblage	Chert	Obsidian	Quartz	Groundstone	Ovenstone	Pumice	Ochre
Sikopo, Arnavon Islands	51	1	-	-	6	99	-
Papatura, NW Isabel	229	-	-	-	17	1	-
Suavanao, NW Isabel	27	-	-	-	-	-	-
Kusira, NW Isabel	12	-	-	-	-	-	-
Poaraghi, NW Isabel	5	-	-	-	-	-	-
Mendana Bay, C Isabel	197	-	-	-	1	-	-
Laena Island, SE Choiseul	36	-	117	-	-	27	3
Wagina, SE Choiseul	126	-	8	2	4	-	-
Rokoso, SE Choiseul	2	-	8	-	-	-	-
Total NISP	685	1	133	2	28	127	3
% of Total Assemblage	70.0	0.1	13.6	0.2	2.9	13.0	0.3

By weight, chert also formed the largest portion of the entire assemblage followed by ovenstone and two groundstone tools (Table 8.2). The largest assemblages of chert artefacts were gathered from surface collections on two Isabel sites, Papatura (PAP-1) and a chert quarry site at Mendana Bay (MEN-1), and on Wagina in southeast Choiseul. In addition to archaeological material, geological samples of chert were also collected at Mendana Bay and from another chert deposit near Suavanao located in northern Isabel. The largest excavated sample of chert was recovered on Sikopo in the Arnavon Islands, which comprised 49 of the 51 pieces recovered from there. The only obsidian fragment found during the field seasons and most of the pumice were also collected during the excavation on Sikopo. The remaining sections describe these artefact classes in more detail.

Table 8.2 Total weight of lithics collected in Manning Strait per site and material type.

Assemblage	Chert	Obsidian	Quartz	Groundstone	Ovenstone	Pumice	Ochre
Sikopo, Arnavon Islands	133	0.1	-	-	63.3	92.6	-
Papatura, NW Isabel	3193.4	-	-	-	541.7	0.6	-
Suavanao, NW Isabel	175.1	-	-	-	-	-	-
Kusira, NW Isabel	341.9	-	-	-	-	-	-
Poaraghi, NW Isabel	190.5	-	-	-	-	-	-
Mendana Bay, C Isabel	2303.7	-	-	-	175.5	-	-
Laena Island, SE Choiseul	81.8	-	309.8	-	-	22.1	0.4
Wagina, SE Choiseul	382.7	-	93.7	558.2	97.9	-	-
Rokoso, SE Choiseul	7.4	-	11.7	-	-	-	-
Total Weight (g)	6809.5	0.1	415.2	558.2	878.4	115.3	0.4
% of Total Assemblage	77.6	0.001	4.7	6.4	10	1.3	0.005

8.2 Chert

Overall, there was a relatively wide range of chert tool types identified in the total sample size of 685 chert pieces. Flakes, cores and angular fragments, the latter referring to undiscernible angular shatter or 'debris' created at some point during the stone tool manufacturing process (e.g. Sullivan & Rozen 1985: Fig. 2), formed approximately 93% of the total assemblage (Table 8.3). The remaining fraction of the assemblage comprised blade-like flakes, scrapers, a single drill point and a waisted artefact. The rest of this section expands on technological and metric attributes recorded for these artefact types. Comparisons are made between the three largest assemblages - Mendana Bay, Papatura and Wagina - as well as the three smaller assemblages - Sikopo, Laena Island and Kusira - to provide insight into behavioural and spatial patterns related to resource maximisation. Before these assemblages are compared, however, a brief assessment of the colour and quality of chert collected in the Manning Strait region will be given.

Table 8.3 Total number and weight of chert artefacts and non-artefacts per site.

Assemblage	Flakes	Cores	Shatter	Blades	Scrapers	Drill points	Other*	Non-artefact**
Sikopo	42	-	9	-	-	-	-	-
Papatura	178	36	9	6	-	-	-	-
Suavanao	-	-	-	-	-	-	-	27
Kusira	5	5	1	-	-	-	1	-
Poaraghi	1	1	-	1	-	-	-	2
Mendana Bay	114	14	63	3	-	-	-	3
Laena Island	25	-	9	-	1	1	-	-
Wagina	109	7	10	-	-	-	-	-
Rokoso	2	-	-	-	-	-	-	-
Total No	476	63	101	10	1	1	1	32
% of Assemb.	69.5	9.2	14.7	1.5	0.1	0.1	0.1	4.7
Total Weight (g)	2643.7	2874.5	495.9	159.8	7.9	1.8	36.3	311.3
% of Assemb.	40.5	44	7.6	2.4	0.1	0.03	0.6	4.8

*Includes anomalous waisted piece.

**Includes geological samples and unmodified fragments.

8.1.1 Colour and Stone Quality

The chert varied considerably in colour. To avoid assigning each piece to its own unique Munsell colour code, the artefacts were classified using a select range (Figure 8.1). The most commonly recorded colours were black, blueish grey, pinkish white, white, dark brown, light brown and pink. All of the shades listed in the figure were accounted for in the Mendana Bay chert source, although approximately 60% of the flakes and cores collected at the site were characteristically black or dark blueish grey in colour. Patina usually appeared white or pinkish white. There was variation in the translucency of the Manning Strait cherts, ranging between completely opaque and transparent. Chalcedony differs from chert on a petrological level by its fibrous quartz structure; chert is characterised by a more granular structure (Bates & Jackson 1984). As the microstructures of the Manning Strait samples were not examined, it was not possible to distinguish the chalcedonic formations from chert. For this reason and for the sake of simplicity, the stone will herein be referred to as chert.[10]

Colour	Munsell Colour Code	Munsell Colour Name
	Gley 1 2.5/N	Black
	Gley 1 5/N	Grey
	Gley 1 4/5G	Dark blueish grey
	Gley 5/10B	Blueish grey
	Gley 1 8/N	White
	10R 8/2	Pinkish white
	5YR 8/4	Pink
	10R 4/8	Red
	10R 4/4	Weak red
	10R 2/2	Very dusky red
	7.5YR 4/3	Light brown
	7.5YR 3/4	Dark brown
	10YR 8/2	Very pale orange
	10YR 6/6	Dark yellowish orange

Figure 8.1 Colours recorded from analysis of flaked chert artefacts from Manning Strait.

There was also considerable variation in the quality of the chert, referring specifically to the flaking or fracturing properties and homogeneity of the stone (Luedtke 1992). Chert was considered homogenous if it was "of an even texture and relatively free of flaws, cracks, inclusions, cleavage planes and grains" (Crabtree 1967: 8). Rarely, did the Manning Strait cherts appear completely homogenous. As is commonly observed for this compositionally variable stone type (Luedtke 1992), the Manning Strait cherts varied in their isotropy. A basic scale of 'quality' was created from an assessment of the entire Manning Strait collection and was used to differentiate and group the archaeological assemblages (Table 8.4).

Table 8.4 Quality scale used in classification of Manning Strait cherts.

Quality	Visual Description
High	Few to no impurities and cracks; very thin, evenly textured cortex; opaque
Moderate	Moderate amount of impurities and cracks; thinner, chalky cortex; moderately transparent
Poor	High number of impurities and cracks; thick, unevenly textured chalky cortex; highly transparent

[10] Historically, there has been considerable variation in the naming and description of artefacts made from 'chert', 'flint' and 'chalcedony' in Solomon Islands which can cause confusion (e.g. Ivens 1931; Harrison 1931; Woodford 1908).

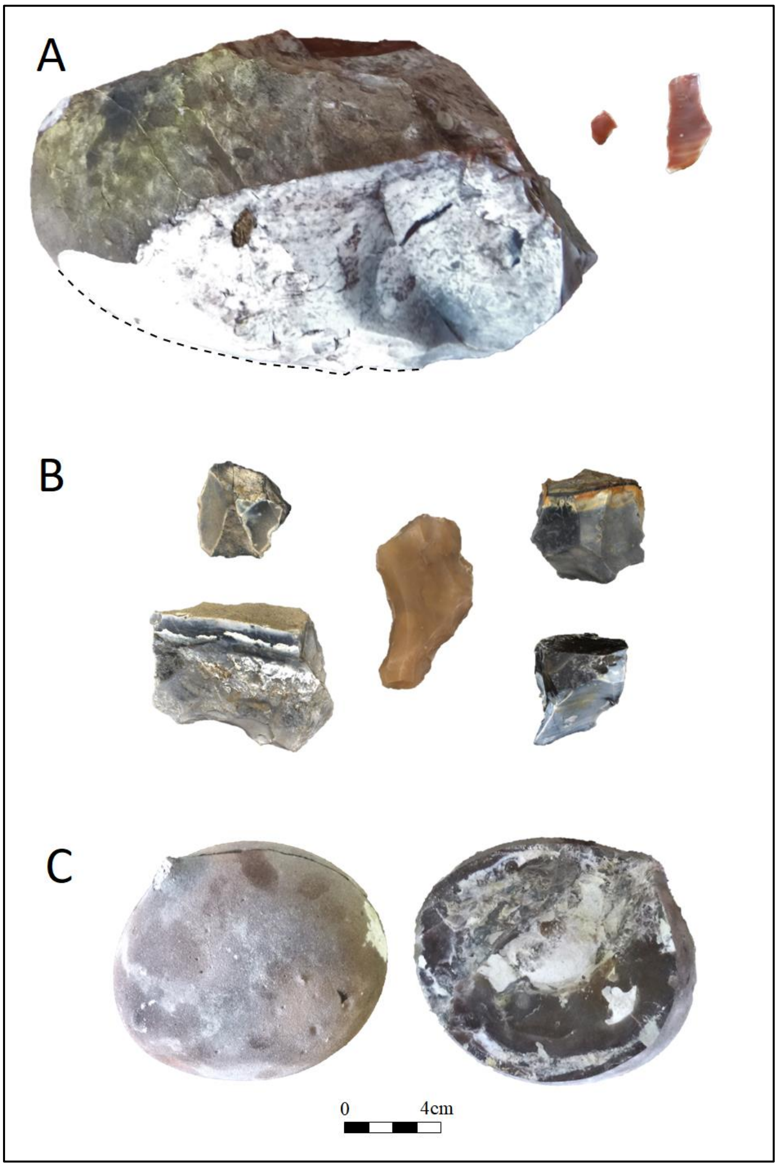


Figure 8.2 High quality (A), medium quality (B) and low quality (C) chert from the Manning Strait region.

The samples used to create the scale included: 1) a nodule collected from Suavanao Airfield that was characterised to be of poor quality; 2) cores recovered on Kusira which were characterised as examples of medium quality; and 3) a likely river nodule found on Laena Island which was characterised to be of high quality (Figure 8.2). Mendana Bay was the only primary source or outcrop of chert recorded during surveying. There is likely to be another outcrop of chert located near Suavanao as was indicated by the nodule found there, although I did not see the source first-hand. Additionally, Barora Faa may possess secondary streambed deposits around the coast of the island or chert outcrops inland. Further surveying would be required to determine this.

8.1.2 Flakes and Angular Fragments

Comparing the average size of flakes and angular shatter observed between the three largest assemblages - Mendana Bay, Papatura and Wagina - it was demonstrated that, overall, larger flakes were manufactured at the first two sites (Figure 8.3). Typically, flakes from Mendana Bay and Papatura measured approximately 30-35 mm long, 20-25 mm wide and 10 mm thick. Measurements were taken at their maximum point (e.g. maximum length, width and thickness) (see Andrefsky 2005: Chp. 7). While for the Wagina assemblage, flakes usually measured about half this size.

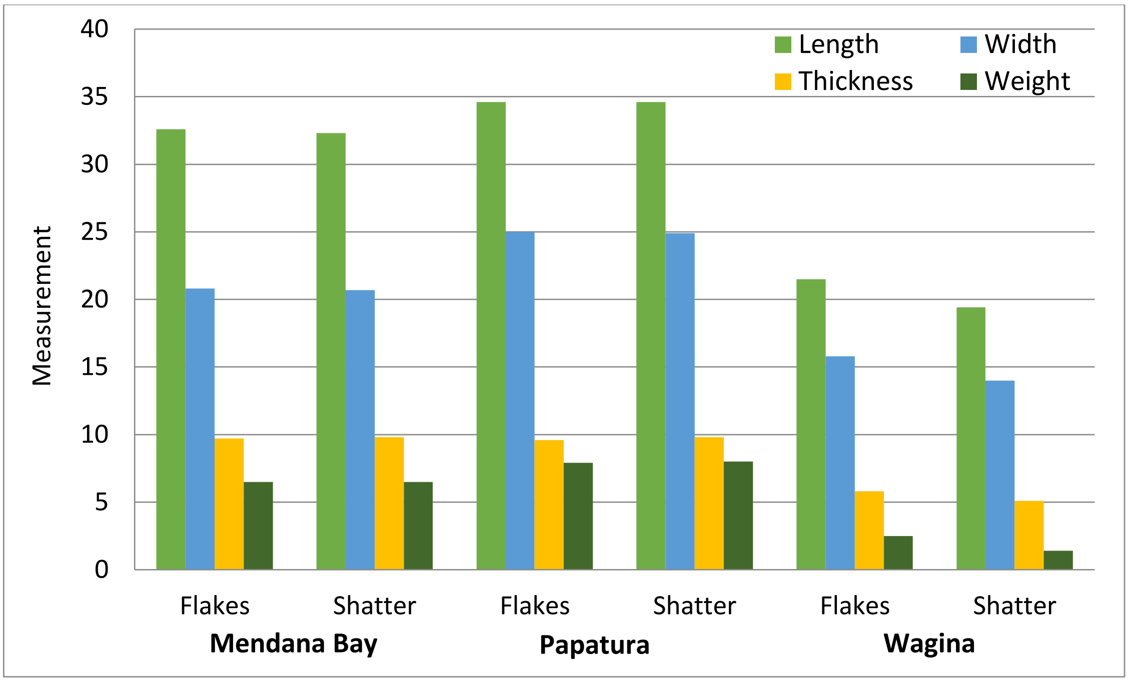


Figure 8.3 Average length, width, thickness and weight of flakes and shatter collected from Mendana Bay, Papatura and Wagina. Measurements in mm and g.

Approximately 87% the Wagina chert assemblage was collected from a ridgetop settlement site (WAG-11) which has been gardened over the last several decades. Fragmentation from ploughing was posited to have contributed towards the generally smaller size of the flakes and shatter. However, a comparison of breakage patterns between these assemblages did not demonstrate any clear evidence of a higher degree of fragmentation of the Wagina assemblage (Figure 8.4). On the contrary, 64.2% of the Wagina flakes were determined to be completely intact, which was almost 10% higher than the Mendana Bay assemblage. Examples of chert flakes from Mendana Bay and Papatura are illustrated in Figure 8.6.

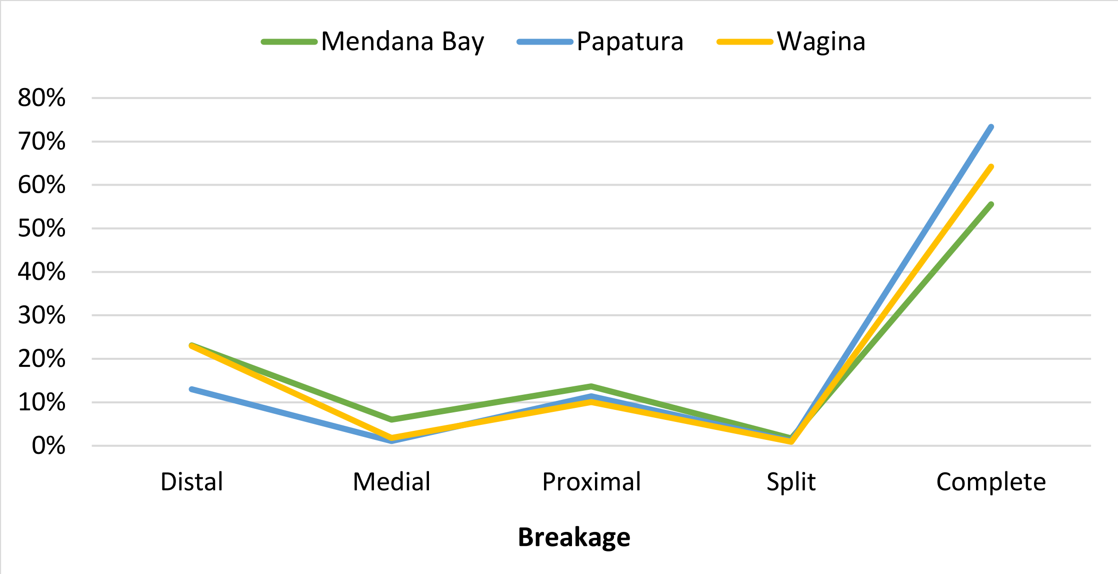


Figure 8.4 Breakage proportions of flakes from Mendana Bay, Papatura and Wagina.

For the smaller chert assemblages recovered from Kusira, Laena Island and Sikopo, a similar pattern in flake and shatter size was observed. On average, flakes and shatter found at Kusira were relatively large and were comparable in size to the Mendana Bay and Papatura assemblages. While those found at Laena Island and Sikopo were about a third smaller, typically measuring 21-23 mm long, 15-17 mm wide, and 5-6 mm thick (Figure 8.5).

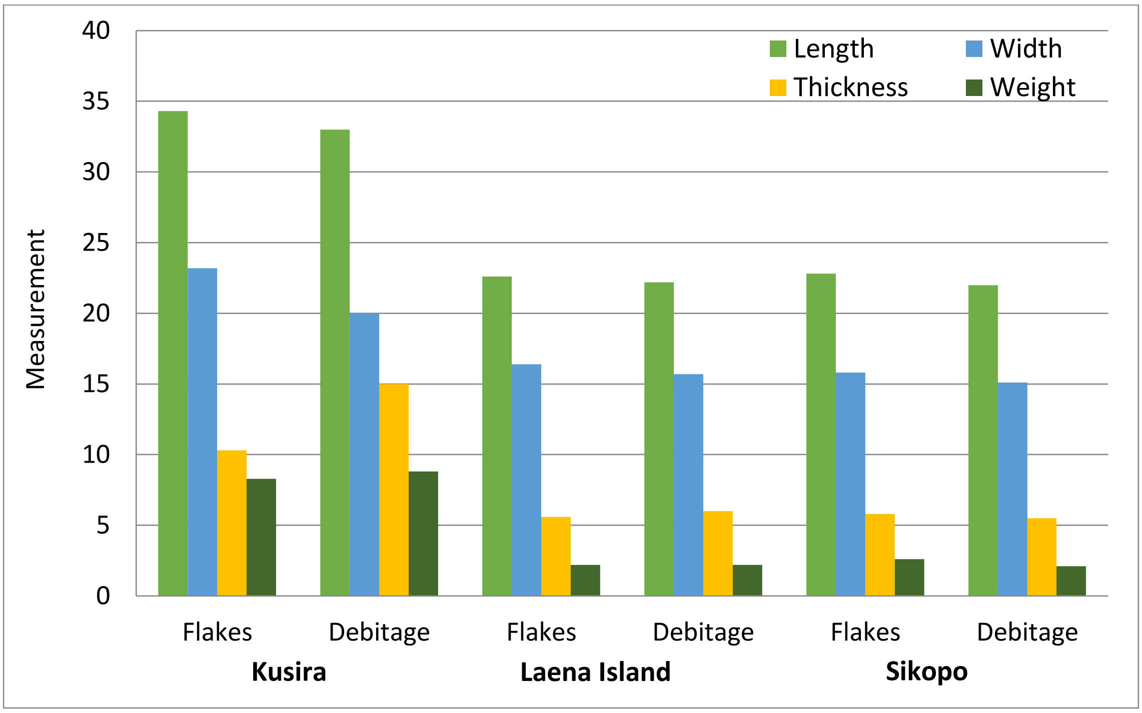


Figure 8.5 Average length, width, thickness and weight of flakes and shatter collected from Kusira, Laena Island and Sikopo. Measurements in mm and g.

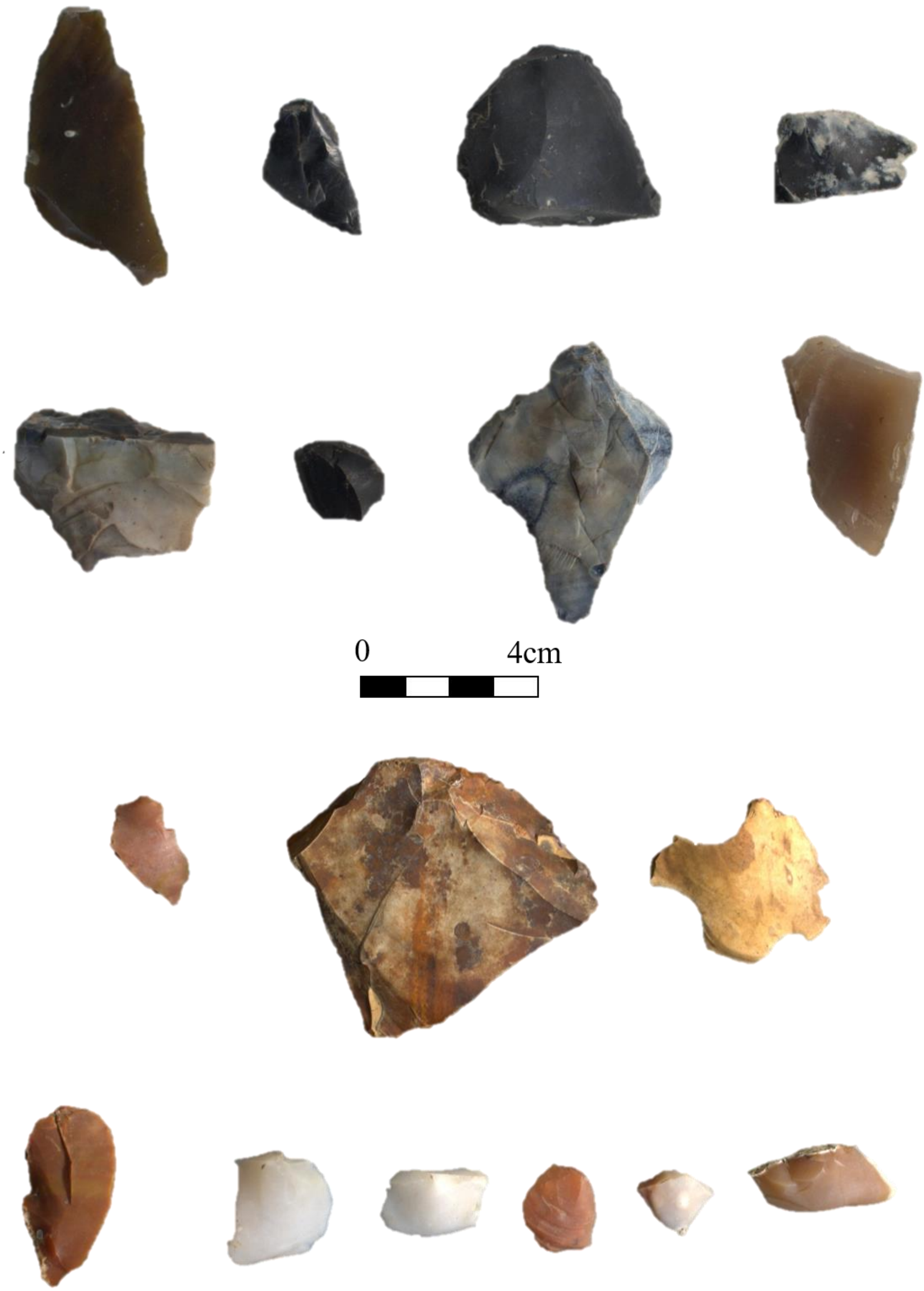


Figure 8.6 Examples of chert flakes found in Manning Strait. Ventral faces shown and oriented with proximal ends pointed up. Above scale: Mendana Bay flakes; below scale: Papatura flakes.

Comparing occurrences of retouch and/or usewear between the assemblages, the Papatura assemblage exhibited the highest proportion (Table 8.5). Approximately 60% of the flakes found at the site exhibited some form of usewear and/or retouch (Figure

8.7). Direct retouch - defined as retouch occurring from the ventral to dorsal surface (Inizan *et al*. 1999: 140) – was the most commonly observed form of retouch. Bifacial retouch was only observed on one of the blades and about 4% of the flakes (N=17). The Wagina assemblage exhibited the highest proportion of usewear and very little evidence of retouch. The small average size of the Wagina flakes may have contributed to the lack of retouch observed for the assemblage. This may also explain the lower proportions of the Sikopo and Laena Island flakes exhibiting retouch which were only 7% and 11%, respectively. Usewear for both the Wagina and Papatura flakes predominantly appeared in the form of microchipping and, to a lesser extent, edge rounding.

Table 8.5 Total number of flakes with usewear, unifacial retouch, bifacial retouch, both usewear and retouch or no modification.

Site	Usewear	Unifacial	Bifacial	Usewear/Ret.	Unmodified	Total*
Mendana Bay	11	20	3	18	65	117
Papatura	28	40	4	41	71	184
Wagina	22	5	2	5	75	109
Kusira	1	2	-	-	2	5
Laena Island	5	4	-	3	13	25
Sikopo	1	3	-	-	38	42

*Including blade-like flakes.

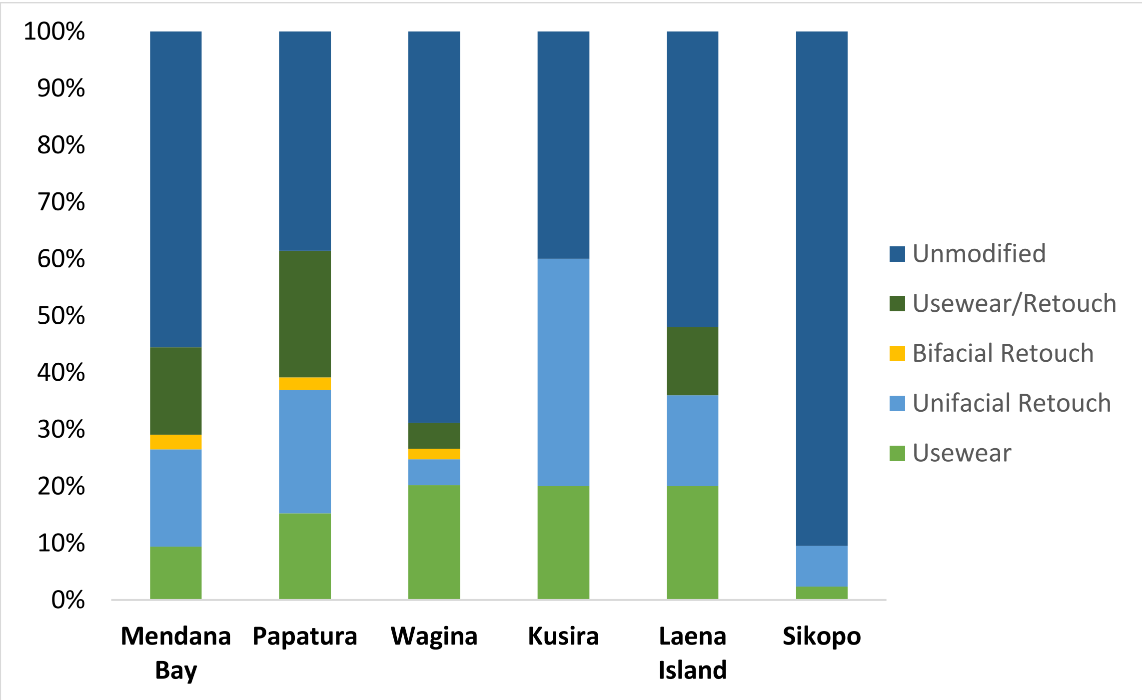


Figure 8.7 Distribution of flakes exhibiting usewear, unifacial or bifacial retouch, both usewear and retouch, or no modification. Includes blade-like flakes.

Retouch typically appeared shallow, ranging between 1-2 mm in height (Figure 8.8). Although occasionally flakes were retouched more steeply reaching 4-6 mm in height. Retouching of the Papatura flakes typically appeared slightly deeper than the remaining sites. Serrated edges were rare and was only identified on one flake from Papatura.

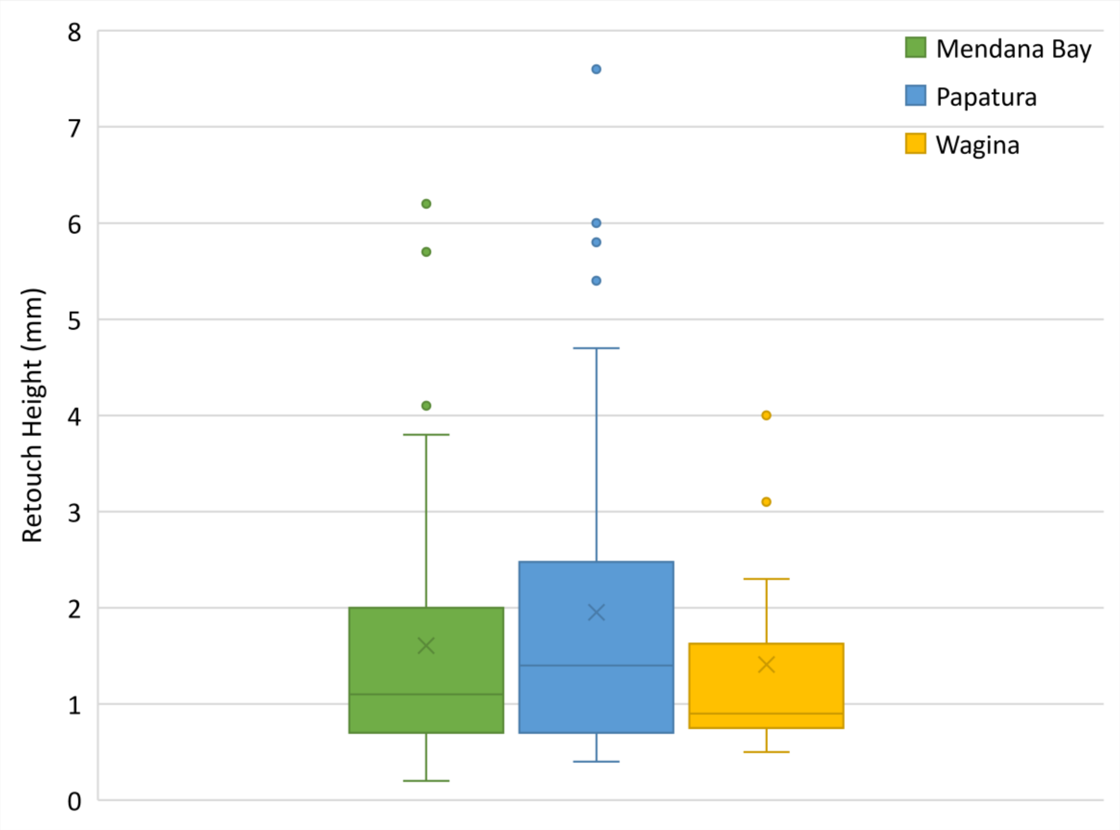


Figure 8.8 Ranges of retouch height observed for Mendana Bay, Papatura and Wagina assemblages. "X" represents average height.

While the Papatura assemblage possessed the highest proportion of retouched flakes, the Mendana Bay flakes appeared to be the most intensively retouched (Figure 8.9). Approximately 24% of the retouched flakes from Mendana Bay exhibited retouch along 50% or more of the flake circumference. Whereas for the Papatura assemblage, this figure only reached about 12%. Most of the retouched flakes from this site were retouched around less than 25% of the flake circumference. The greater intensity observed in the retouching of chert at Mendana Bay may reflect a poorer quality or cutting ability of some of the chert from this deposit. This difference may also reflect a difference in flaking skill between the craftspeople. Knappers at Papatura were creating larger flakes and may have been more skilled in creating suitable cutting edges with minimum modification.

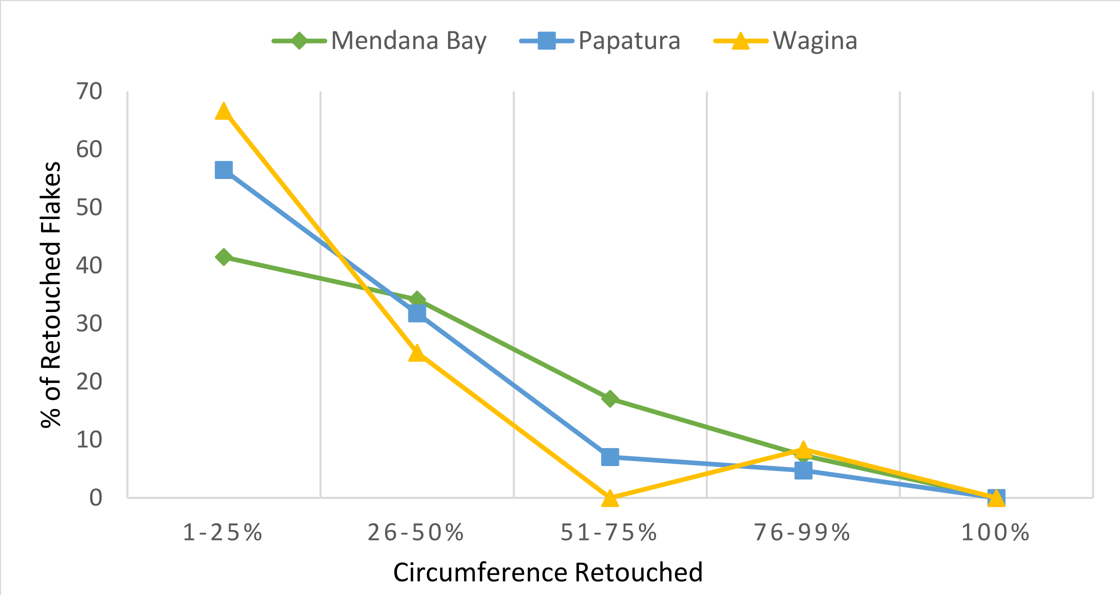


Figure 8.9 Distribution of retouched flakes per incremental level of retouch observed around the flake circumference for the Mendana Bay, Papatura and Wagina assemblages.

8.1.3 Cores

Cores recovered at the chert quarry site at Mendana Bay were, on average, the largest and measured about 50 mm long, 38 mm wide and 26 mm thick (Figure 8.10). Cores found at Kusira and Papatura were comparable in size. While, in a similar trend observed for the flakes and shatter, cores found on Wagina were typically much smaller and measured about 32 mm long, 23 mm wide and 19 mm thick. On average, they weighed around 13 g, whereas the Papatura, Kusira and Mendana Bay cores typically weighed about five times as much.

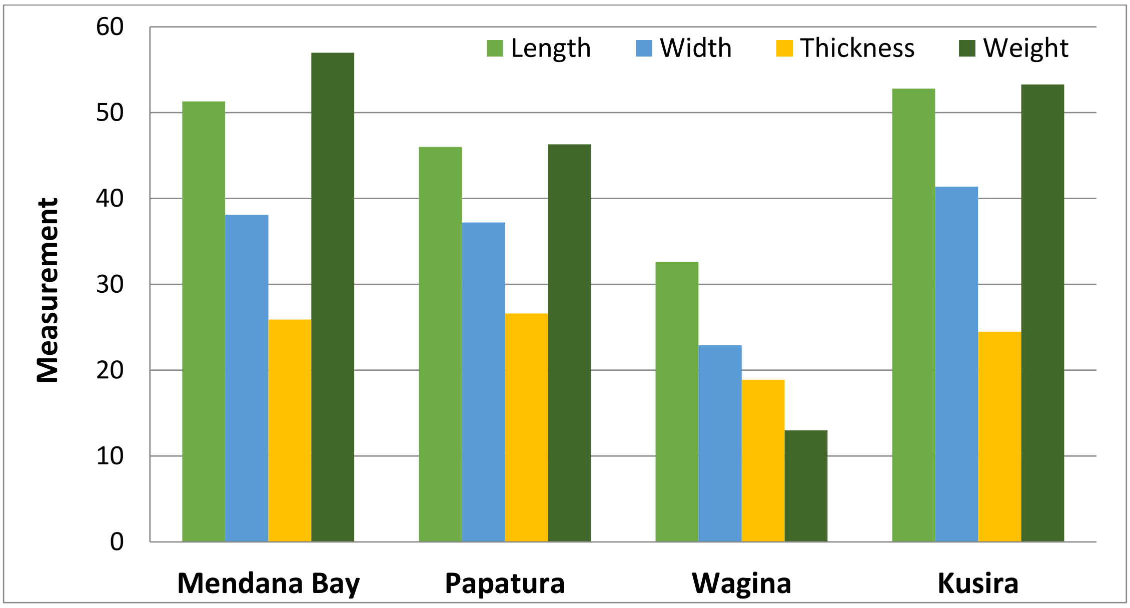


Figure 8.10 Average length, width, thickness and weight of cores from Mendana Bay, Papatura, Wagina and Kusira. Measurements in mm and g.

Cores recovered from Mendana Bay exhibited the least number of negative flake scars, on average (Table 8.6). This assemblage also scored the lowest in the maximum number of flake scars recorded, and in the maximum length of a flake scar. At the opposite end of the spectrum, the Wagina cores typically appeared more extensively flaked as they possessed the highest average number of flake scars. The Papatura assemblage also demonstrated evidence of the maximisation of cores. For both this assemblage and the Wagina cores, the most common factors recorded for the potential reason of discard of the core were 'exhausted', 'too small' and/or 'too many step fractures'. 'Internal flaws' were also a common reason recorded for all the assemblages.

Table 8.6 Minimum, average and maximum number of negative flake scars observed on cores, and average and maximum length of the flake scars. Length in mm and 'Sample' refers to number of cores in assemblage.

Assemblage	Sample	Min. No	Av. No	Max. No	Av. Length	Max. Length
Mendana Bay	14	1	2.1	5	15.8	19
Papatura	36	1	5.4	18	20.8	43
Wagina	7	4	7.1	11	15.4	21
Kusira	5	2	4.2	7	19.2	33

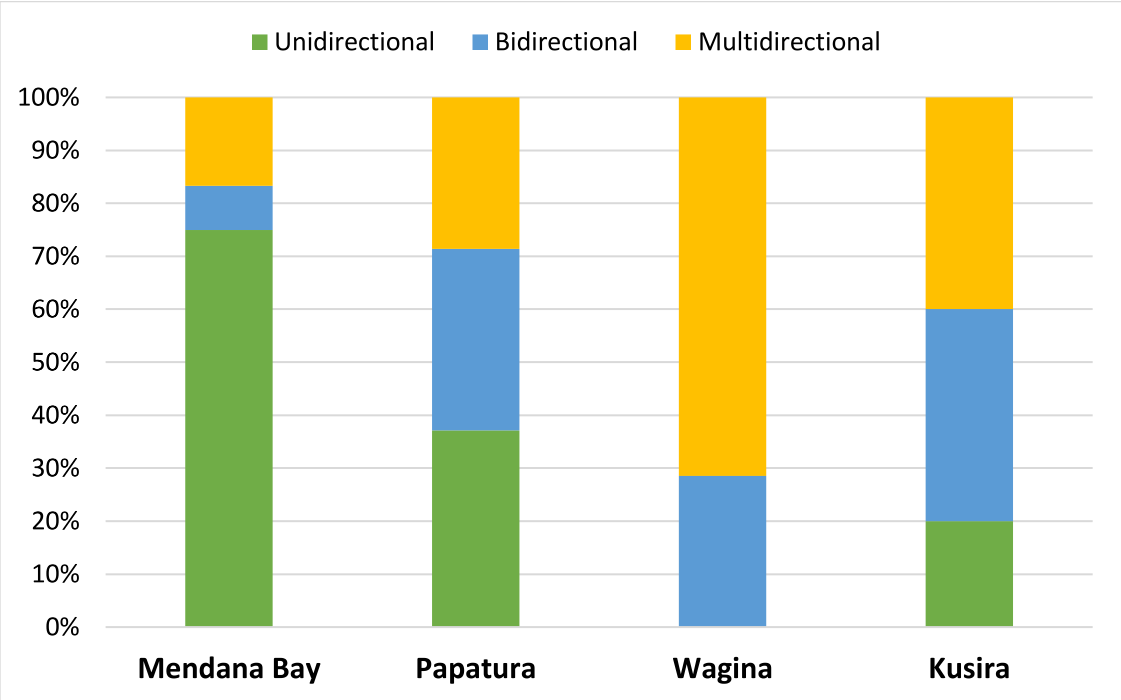


Figure 8.11 Distribution of unidirectionally, bidirectionally and multidirectionally flaked cores between the Mendana Bay, Papatura, Wagina and Kusira assemblages.

Comparing patterns of core rotation or the number of flaking directions recorded for each core, the Mendana Bay assemblage demonstrated, by far, the highest proportion of single or unidirectionally flaked cores (Figure 8.11). These cores typically possessed between one and two platforms. The Papatura assemblage was evenly balanced between unidirectional, bidirectional (opposing) and multidirectional cores. No unidirectionally flaked cores were identified within the Wagina assemblage; most of these cores possessed between two and four platforms, and were flaked from between two to four directions. The Kusira cores, alike the Papatura assemblage, were relatively evenly distributed between the three different types of cores. The stark difference between the Mendana Bay and Wagina cores may provide further support for reduction techniques favouring the maximisation of raw material at the latter site. This is discussed further in section 8.7.

8.1.4 Blades, Scrapers, Drill Points and Miscellaneous

In addition to the large number of chert flakes, shatter and cores present in the Manning Strait assemblages, a total of 10 blades, two scrapers, one drill point and a single waisted artefact were also identified. The chert artefacts classified as 'blades' were elongated flakes that were blade-like in appearance as they fit the traditional criteria of blades – length at least twice as long as width (Ballin 2000: 11) (Figure 8.12). In contrast to more formal blade reduction techniques documented in other parts of the Pacific such as New Zealand (Leach 1984; Kooyman 1985; Leach & Leach 2019), the blades described here are considered likely to be fortuitous pieces (e.g. see Sheppard 1993). On average, the blades were generally small, measuring 52.7 mm long, 21.9 at their widest point, 11.7 mm at their thickest point and weighing 13.4 g. They typically exhibited a moderate (50%) to extensive (75-99%) amount of retouch around the blade margins. Seven of the ten specimens exhibited retouch that ranged between 0.7-3.3 mm in height, and of these seven samples, five were bilaterally retouched while the other two were retouched on only one side.

A single curved scraper was excavated at the Apuseva Wall Formations (LAE-1) site located in northern Laena Island (Figure 8.13A). The artefact measured 39 mm long, 17 mm at its widest point, 7 mm at its thickest point and weighed 4 g. It exhibited microscopic usewear along the entire margin of the cutting edge that was generated most likely from gentle scraping or slicing of plant or other forms of soft materials. Morphologically, the tool resembled curved side-scrapers manufactured from chert that have been documented in southeast Malaita (Moser 2012: Fig. 11: 5).

Figure 8.12 Chert blade-like flakes identified in Manning Strait assemblages. Dorsal faces shown and oriented with proximal ends pointed up. Top row: from Poaraghi and Mendana Bay. Bottom row: from Papatura.

Figure 8.13 Chert scraper and drill point found in northern Laena Island. A: ventral and dorsal surfaces. B: dorsal, profile and ventral surfaces.

A likely drill point was recovered from the surface of Apuseva Hilltop (LAE-2) also located in northern Laena Island (Figure 8.13B). The artefact, which was found alongside several grindstones and shell rings and other shell valuables in various stages of manufacture, was bilaterally retouched and appeared morphologically similar to chert drill points recorded elsewhere in Melanesia (Allen *et al*. 1997; Burley & Freeland

2019). It measured 25 mm long, 14.5 mm at its widest point, 7 mm at its thickest point and weighed 1.84 g. There was some evidence of edge-rounding near the pointed end of the artefact observed microscopically. However, its tip is missing and there were no striations from rotatory wear identified.

An extensively flaked and waisted chert artefact was found at Kusira in northwest Isabel (Figure 8.14). It measured 50 mm long, 29 mm at its widest point, 19 mm at its thickest point and weighed 24.5 g. The waist may have been created unintentionally during the flake removal process, however, the artefact appeared morphologically distinctive from the entire assemblage. The artefact shared some resemblance with chert adzes and preforms reported from Makira/Ulawa (e.g. Walter and Green 2011: Fig. 5.15C), although this may well be coincidental.

Figure 8.14 Waisted chert artefact found at Kusira, northwest Isabel. Dorsal (left), profile (centre) and ventral (right) surfaces.

8.3 Obsidian

Only one obsidian artefact was recovered during fieldwork in Manning Strait and its geochemical sourcing to Talasea in West New Britain, Papua New Guinea, is described in detail elsewhere (Radclyffe *et al.* 2019). The flake was recovered in a 3 m^2 excavation carried out on Sikopo (SIK-1), Arnavon Islands. It was recovered from the sieve and found 30-40 cm deep. This was at the same level as 'shell heap' features identified in the stratigraphy and aligned with the second phase of post-Lapita occupation of the site dated to 625-500 calBP. Disturbance from crab burrowing and tree root growth was identified in the excavation, however. This may have displaced the flake from nearer the bottom of the cultural deposit which dated slightly earlier to 825-700 calBP.

The flake measured 8.77 mm in length, 13.25 mm in width, 1.54 mm thick and weighed 0.13 g (Figure 8.15). Its small size indicated it may have been produced during the preparation of a core or the manufacture of a larger flake. Possible usewear was evident on its distal margin, and ripples running in opposing directions on the ventral and dorsal surfaces suggest percussive bipolar flaking was implemented.

Figure 8.15 Obsidian flake excavated on Sikopo, Arnavon Islands, showing ventral (left) and dorsal (right) surfaces.

Geochemical characterisation of the flake was carried out using pXRF at the Otago Archaeology Laboratories (OAL). A Bruker Tracer III-SD was used to target seven mid-Z elements (Fe, Ga, Rb, Sr, Y, Zr, Nb) using green filter settings (40 kV per channel, filament ADC = 30 μA, filter = 12 mil Al + 1 mil Ti + 6 mil Cu, runtime = 300 s). Ensuring the flake covered the detector's field of view, five readings were taken of it, each directed at different points on its ventral and dorsal surfaces. A basalt standard (BHVO-2) was analysed as a quality control to assess the accuracy of the reported data. It was analysed once before and once after the five readings of the flake were taken. Geological samples selected to be compared with the flake were previously analysed at OAL using the same machine and settings as the archaeological sample (Table 8.7). Calibration to parts per million (ppm) was undertaken on all samples using Bruker's factory OB40 calibration.

Table 8.7 Results of pXRF analyses in parts per million for five Sikopo measurements and geological samples.

Sample	Fe	Ga	Rb	Sr	Y	Zr	Nb
Sikopo 1	12297	27	71	242	25	162	8
Sikopo 2	13069	23	71	248	25	166	6
Sikopo 3	13327	24	75	243	26	166	6
Sikopo 4	12746	22	73	240	26	164	6
Sikopo 5	12528	25	68	242	26	164	7
Kutau/Bao	7366	13	47	162	19	127	3
Kutau/Bao	8068	14	53	175	21	139	3
Kutau/Bao	8355	16	53	185	21	138	4
Kutau/Bao	8202	15	55	179	21	136	3
Kutau/Bao	8538	15	53	179	21	138	3
Kutau/Bao	8593	14	55	183	21	140	4
Kutau/Bao	8525	15	53	180	22	139	4
Baki	9526	15	56	125	29	154	4
Baki	9552	14	56	124	29	154	4
Baki	10020	16	57	128	28	158	5
Baki	8945	16	58	112	27	138	4
Gulu	7651	14	54	130	19	130	3
Gulu	7712	14	57	131	19	136	3
Mopir	8631	14	37	169	27	127	4
Mopir	8978	16	38	174	28	131	4
Lou	18184	21	146	68	42	387	46
Lou	17911	20	144	69	41	383	45
Lou	17737	19	141	68	41	382	46
Lou	17582	19	141	67	40	374	45
Lou	16768	19	136	65	40	364	44
Lou	13554	18	138	61	38	296	40
Lou	12676	16	125	56	35	279	37
Lou	19922	18	121	81	43	404	46
Lou	17068	18	138	66	39	369	44
Lou	16797	18	136	66	38	362	44
Lou	16516	19	137	62	39	360	43
Lou	16902	18	137	66	40	372	44
Pam	13364	18	149	41	40	264	43
Pam	13920	19	156	44	42	275	44
Pam	14919	19	152	48	39	273	42
Pam	13741	20	154	42	40	267	42
E. Fergusson	21128	22	113	5	74	882	27
E. Fergusson	22213	22	118	4	77	918	27
E. Fergusson	26902	19	157	3	115	1465	43
E. Fergusson	21876	19	114	3	73	896	28
E. Fergusson	25172	22	129	4	63	605	25
E. Fergusson	27961	20	133	5	65	620	23

W. Fergusson	9700	19	125	69	25	282	10
W. Fergusson	9505	19	125	72	26	298	10
W. Fergusson	9243	18	130	60	27	274	10
W. Fergusson	9475	18	124	69	24	284	10
W. Fergusson	8111	19	128	102	22	194	9

Assigning the flake to its most likely Pacific obsidian source involved the use of principal component analysis (PCA) and the creation of scatterplots using elemental ratios. PCA was carried out using the MV-ARCH statistical program which first standardises the chemical compositional data using the base-10 logarithm (Wright 1991). For the plotting of elemental ratios, it was found that Rb/Y and Sr/Zr proved best in separating known sources.

The PCA closely clustered the obsidian flake with the West New Britain sources including Kutau/Bao, Gulu, Baki and Mopir (Figure 8.16). The first component accounted for 85.17% variability, and the second component 11.75%, making a total of 96.92% for the first two components.

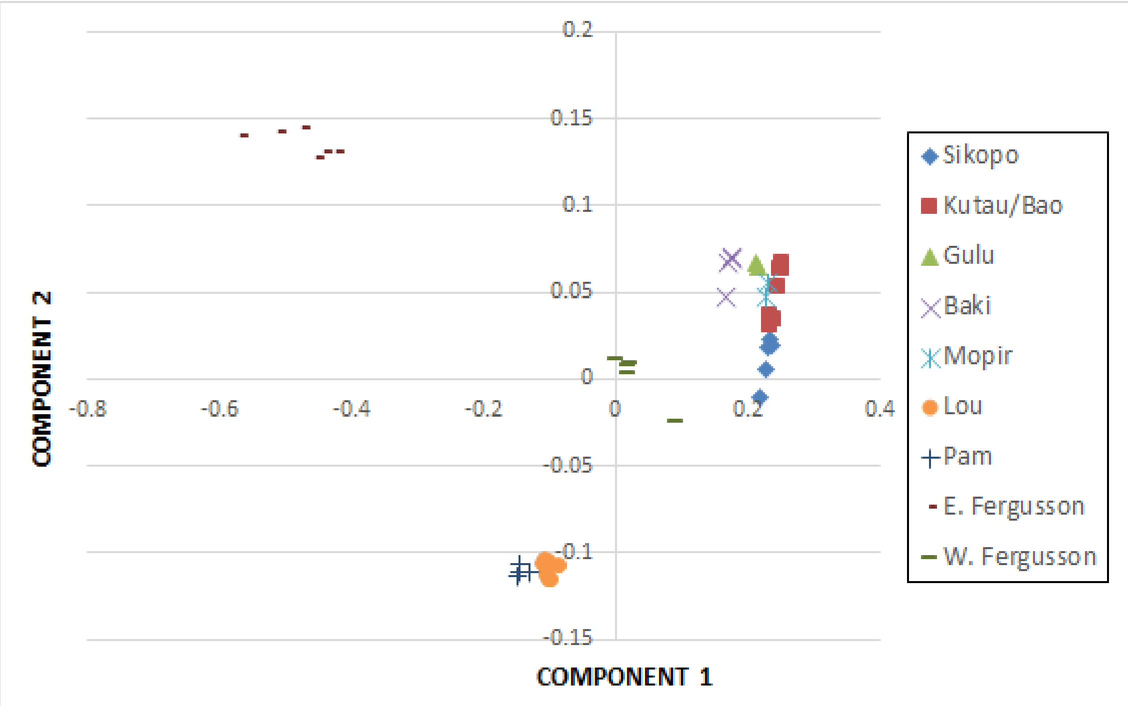


Figure 8.16 Principal component analysis (PCA) plot of Sikopo obsidian against Near Oceania sources.

The source of the flake was then narrowed down further using the scatter plot of Rb/Y and Sr/Zr to Kutau/Bao (Figure 8.17). Interestingly, the PCA distinguished the Sikopo sample from the Admiralties sources, Lou and Pam, from where the external distribution of obsidian appears to have increased leading into the post-Lapita period (Summerhayes 2004: 150-151). Implications of this to our current understanding about prehistoric distribution patterns of obsidian within Solomon Islands and wider Island Melanesia are discussed further in section 8.7.

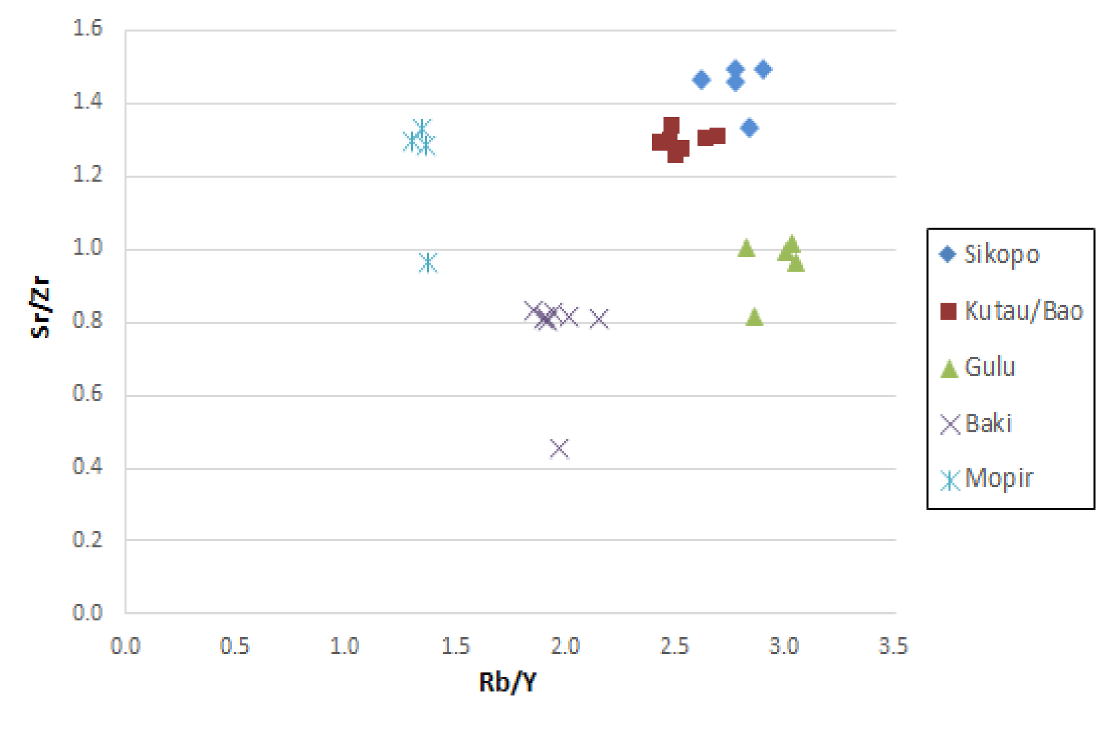


Figure 8.17 Scatter plot of Rb/Y vs Sr/Zr of Sikopo obsidian against New Britain sources.

8.4 Groundstone

Only two groundstone tools were recovered during the Manning Strait field expeditions, both found on Wagina. These included a hammerstone found at Nikumaroro Garden (WAG-2) within the upper 20 cm of a large pit dug for the construction of a well. Pottery, chert artefacts, fish bone and shellfish were scattered on the surface surrounding the pit. Pottery and chert were also found on the terrace above the slope indicating that it was possible the hammerstone and much of the surface scatter and other buried artefacts were deposited as wash.

The other groundstone tool was an axe head, donated to this study by Bauro, a resident of Kukutin Village. He described that he had found it on the surface of a coral shrine located “in the bush”, within the interior of Wagina but did not specify exactly where. The association of the axe head with a coral shrine is likely to place it temporally within the development of Roviana period coral mound shrines evident in the last five centuries. The hammerstone may be associated with terrace or ridgetop occupation near the southern coastline of Wagina that appears to fall within the same time period. The remainder of this section describes these two artefacts in more detail and comparisons are made with groundstone tools previously recorded in the Western Solomons.

The hammerstone was made from coarse-grained basaltic rock and measured 62 mm at its widest point, 38 mm thick and weighed 233.8 g (Figure 8.18). It exhibited pitting along its circumference indicating percussive force, and striations were also visible in lamp light on the upper and lower surfaces of the hammerstone. The striations may have been created as a result of the scraping of chert flakes and drill points undertaken to sharpen or shape these implements. More in-depth experimentation would be required, however, to test this and compare these striations against those that may arise unintentionally during the percussive use of the tool or post-depositionally.

Figure 8.18 Basalt hammerstone found buried at Nikumaroro Garden Slope (WAG-2), Wagina.

As basalt is not available on Wagina, the tool was imported and may have been manufactured in nearby Choiseul, Isabel or the New Georgia group. There is little comparison that can be made with other hammerstones that have been found in the Western Solomons as they have rarely been found in surveys and are generally poorly documented. Felgate (2003: Fig. 111) reported finding a few *Canarium* hammers made from a soft stone in Roviana. These were cuboid in shape and differed from more formal nut hammers such as the Roviana *kanu* which were made from hard stones such as basalt and were lashed to a long cane handle (Thomas 2003: 364). Reeve (1989: Fig. 8a-b) illustrated two of these nut hammerstones, which were waisted, that were found at Panaivili, New Georgia. On Nuatambu, Miller (1979: Plate 4:7C) recorded a hammerstone made from giant clamshell.

The axe head was also made from coarse-grained basaltic rock, and measured 117.5 mm long, 70 mm wide at its cutting edge, 28 mm at its thickest point and weighed 324.3 g (Figure 8.19). It is waisted and possesses a pointed butt and an oval cross-section. All flake scars have been removed by hammer dressing and grinding, and its uneven cutting edge may indicate flake damage during use that was subsequently ground smooth.

Figure 8.19 Basalt axe found near coral shrine in Wagina interior. Found and donated by Kukutin resident, Bauro.

Stylistically, the axe resembles the head of a 'battle axe', called *karamaho* in Roviana which were a long-handled variety used in warfare (Thomas 2003: 295). Reeve (1989: Fig. 7) described a similar 'waisted axe' form from Panaivili. He wrote, following personal communications with Kenneth Roga, that the axes "are of a type known to have been used in the Solomons well into the 1800s" (Reeve 1989: 55). Iron axe heads became favoured over stone following their introduction by Europeans. The lenticular shape of the cross section of the Wagina sample suggests it may have derived from the New Georgia group. This is based on a summary of axe and adze collections in the Solomon Islands National Museum carried out by Miller (1979: 152-155). He found that most of the Western Solomons specimens conformed to two types, either lenticular or oval cross sections. For the New Georgia specimens, approximately 64% were lenticular and 27% were oval. While for the Choiseul and Isabel collections, 65% and 50% were oval in shape, respectively. Only 6% of the Choiseul specimens were lenticular and none were recorded for Isabel.

8.5 Quartz

A total of 132 pieces of quartz, weighing about 415 g in total, were collected during surveying in the Manning Strait region. This included 16 geological specimens sampled from two sources and 116 archaeological samples collected on Laena Island. The two sources included a small coral outcrop located on a ridge behind Kukutin on Wagina and a raised coral ridge located at Rokoso, southeast Choiseul. Quartz from the latter source, called *sauru* in Avaso (Piko 1976: 109), was collected for comparison with the archaeological material. Before describing the archaeological samples, it is important to first highlight Guso Piko's ethnographic descriptions about the traditional use of the stone resource in Choiseul.

Piko (1976) described that *sauru* served two purposes in the manufacture of traditional Choiseul shell money. First and most importantly, it served as a resource to make an abrasive paste used for grinding and sawing shell. "In order to cut [out] the individual shell rings without breaking the shell", Piko described, "the maker had to use *riku*, a saw [made] from the aerial root of a bush creeper" (Piko 1976: 101). "Sauru powder" was added to water used in the sawing process which served as a "very sharp sand with a good abrasive effect" (Piko 1976: 101-2). S*auru* was also used as a grinding implement or file once a hole had been made in the shell. Piko wrote that once a hole had been made, the "inside… was then ground with another white stone, *sauru*, to smooth it to the required diameter" (Piko 1976: 101).

The archaeological samples were collected from two test pits and from the surface of Apuseva Wall Complex (LAE-1). Stratigraphically, most of the excavated quartz was recovered in the upper two layers of the site although they are likely to date to the radiocarbon age produced for Layer 3 (Table 8.8). Test Pit 2, which was placed at the foot of a coral stone altar located in the centre of the coral wall complex, contained a much higher concentration of quartz artefacts than Test Pit 1. This indicated that *sauru* was being used within the vicinity of the altar or were being discarded as ceremonial offerings at its base.

Table 8.8 Stratigraphic distribution of quartz artefacts from Apuseva Wall Complex (LAE-1), Laena Island.

Context	Surface	Test Pit 1	Test Pit 2
Surface	7	-	-
Layer 1 (300-0 calBP)	-	3	50
Layer 2	-	1	47
Layer 3 (430-150 calBP)	-	1	7
Total	7	5	104

Each of the quartz artefacts were measured for maximum length and thickness, and were examined to record the presence or absence of flaking, grinding, hammering and/or usewear. They were classified, based mainly on their morphological shape, as either files or fragments (Figure 8.20). Those categorised as files were elongated in shape and usually tapered to a pointed or rounded tip. They were further categorised as either complete, tip, medial or butt portions. Amorphously shaped pieces were categorised as 'fragments'.

Figure 8.20 Quartz fragments (upper row) and files (lower row) from Laena Island.

Of the 116 quartz artefacts, 52 were classified as files and the remaining 64 as fragments. Of the 52 files, approximately 36.5% (N=19) were categorised as complete. The complete files were fairly consistent in size (Table 8.9). On average, they measured 31 mm long, 9.74 mm thick and weighed 3.08 g. This equated to approximately twice as long and 4 mm thicker than the average size of quartz and chert drill points that have been reported elsewhere in Melanesia (Burley and Freeland 2019: Table 5; Allen *et al.* 1997: Tables 8, 9). The larger size of the Laena Island files enables them to be gripped and used by hand, thus supporting the feasibility of their use as a file or hand-held drilling implement.

Table 8.9 Measurements of quartz files collected from Laena Island.

Dimension	Mean (mm)	Standard Deviation (mm)	Coefficient of Variation (%)
Max. length	31.00	8.02	25.86
Max. thickness	9.74	3.46	35.55

The clearest example of human modification of the Laena Island quartz was a single piece that appeared to be a bipolar flake as it exhibited crushing on both of its ends and a flat ventral surface (Figure 8.21A). The flake had also been gently hammered around its entire surface which may have been carried out to produce *sauru* powder or to increase grip for lashing to a pump drill (Figure 8.21B). No rotational striations or edge-rounding were identified at its ends, however, suggesting it was more likely the former.

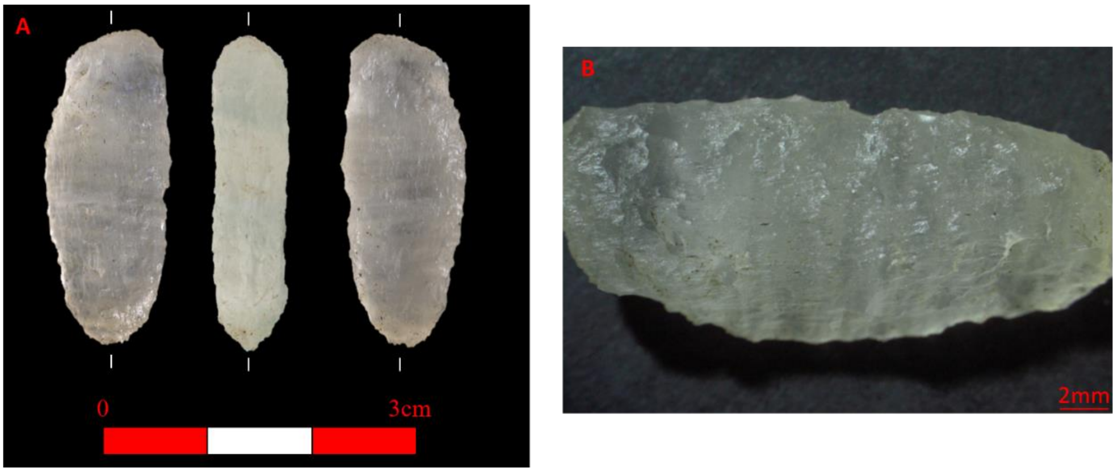


Figure 8.21 Bipolar flake made from quartz. A: dorsal (left), profile (middle) and ventral (right) surfaces. B: Stereomicroscope image of dorsal face illustrating flake scars created from gentle hammering.

Preliminary analysis of the usewear of the quartz files did not clearly indicate evidence of grinding or rotational drilling that has previously been documented on quartz tools

(Sussman 1985; Kononenko *et al*. 2010: Fig. 7; Conte *et al*. 2015; Ollé *et al*. 2016). This was carried out using a hand-held binocular lens and an Olympus SZXY Stereomicroscope adjusted to between 1.0x and 3.6x magnification. One of the quartz fragments, which was tabular in shape, possessed several parallel striations which may have accrued from grinding (Figure 8.22B). For comparison, a geological sample of quartz collected near Rokoso Village was ground against a sandstone file with water for five minutes. Grinding the surface produced an opaquer colour, parallel striations and micro-chipping along the margins of the surface (Figure 8.22D).

It was concluded from the preliminary usewear analysis that most of the quartz fragments were likely to have been deposited at the site, unmodified, and perhaps as ceremonial offerings. While for the modified pieces, some were altered using bipolar flaking possibly to create drill points as has previously been recorded in Melanesia (Allen *et al*. 1997; Burley and Freeland 2019). There was also potential evidence of the quartz being ground and clearer evidence of gentle hammering to create *sauru* powder used as an abrasive mixture.

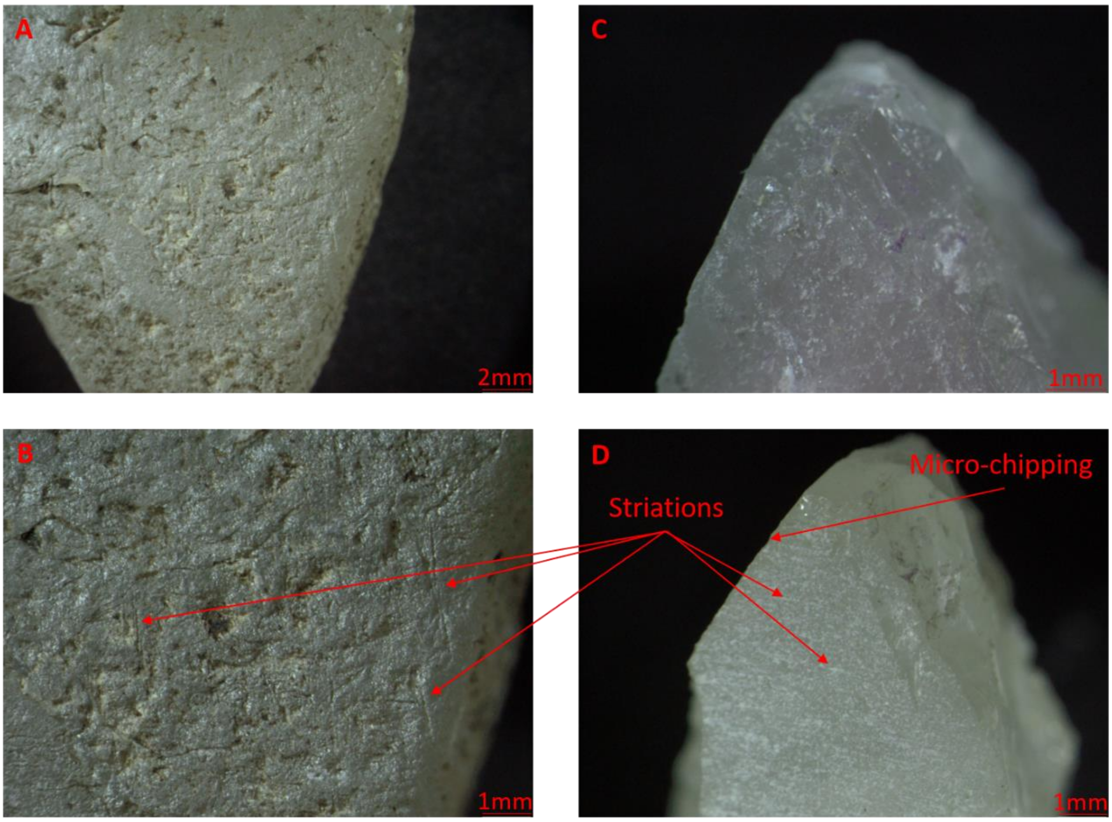


Figure 8.22 Stereomicroscope images of usewear on quartz. A and B: possibly ground surface of tabular archaeological specimen. C: experimental sample before grinding. D: experimental sample after grinding.

8.6 Miscellaneous

Other lithic artefacts identified in the Manning Strait assemblage included pumice abraders and ochre. A total of 127 pieces of pumice were collected during the fieldwork. About 78% (N=99) of these were collected from the 3 m^2 excavation on Sikopo (SIK-1). The remainder were recovered from excavations on Laena Island (N=27) and surface collections on Papatura (N=1). Generally, across all three sites, the pumice was fine-grained and appeared pale to dark orangey brown in colour. The fragments were variable in shape and size, and did not appear to have been specifically modified for their tasks (e.g. Walter and Green 2011: 58). Evidence of usewear was difficult to identify. Although, one large piece excavated on Sikopo exhibited a smoothened discoloured surface, possibly created during the polishing of shell or wood (Figure 8.23).

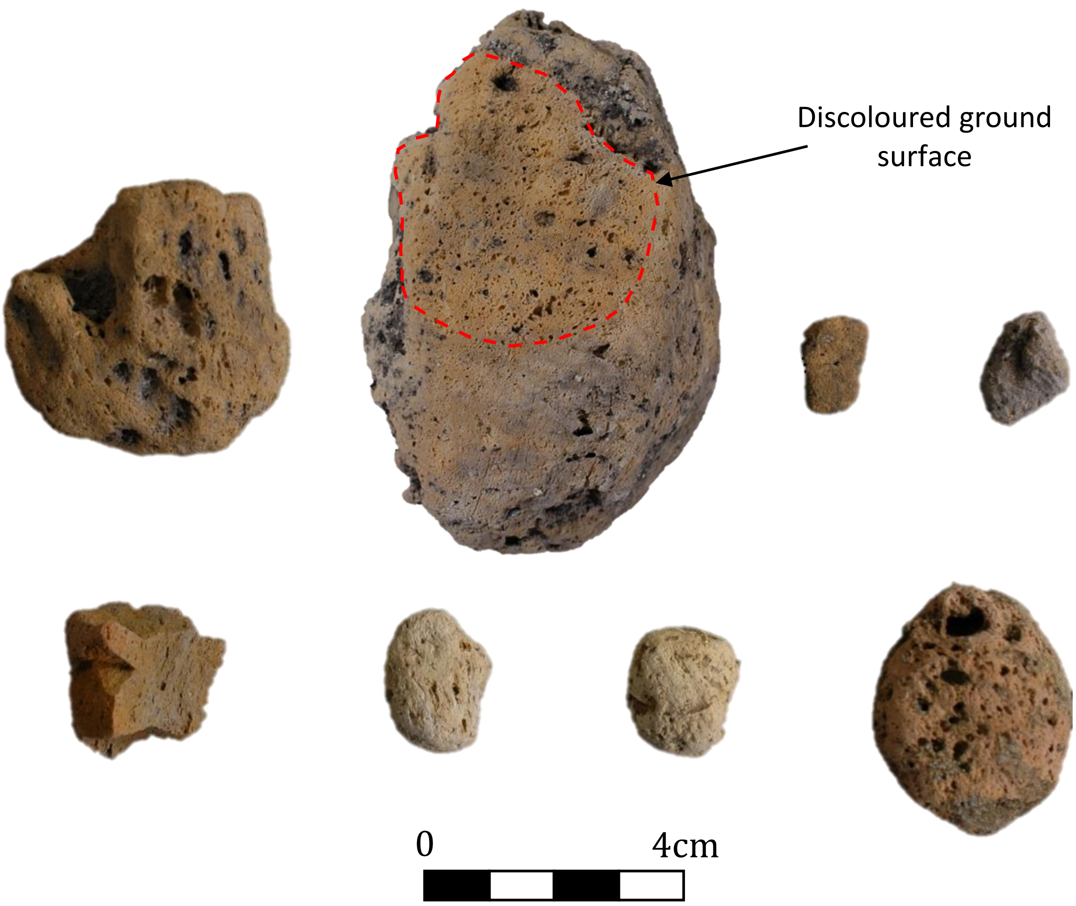


Figure 8.23 Examples of pumice excavated from Sikopo (upper row) and Laena Island (lower row).

The lack of ground facets or other forms of usewear on the bulk of the pumice fragments may suggest their function in other less intensive activities such as cleaning the inside of cooking pots. Another possible use of the pumice, as was observed by Guppy (1887: 76) in the Bougainville Strait region, was as a source of abrasion powder used for smoothening wooden implements such as spears.

Three pieces of red and yellow ochre were also recovered alongside some of the pumice on Laena Island. As an effective colouring agent, ochre, especially red ochre, was commonly utilised and widely traded across the Pacific in the past (see Garling 2017: 217-18). In Melanesia, it has been documented to have been utilised in a wide range of both ritual and utilitarian activities such as body decoration and hair dying, in tattooing, burial practices and to dye slips applied on pottery (Davenport 2002; Blackwood 1935: 382; Oliver 1967: 11). The presence of ochre at Apuseva Wall Complex (LAE-1), therefore, can be interpreted as evidence of colouring or dying most likely for aesthetic or ritualistic purposes. Moreover, this interpretation reinforces the sacredness of the island depicted in oral history (Piko 1976) and described to me by local informants from Rokoso and Nuatambu.

8.7 Conclusion

This chapter has presented findings from descriptive and technological analyses undertaken on the lithic assemblage accumulated from surveys and excavations in Manning Strait. About 70% of the assemblage consisted of chert artefacts, namely flakes, cores and angular fragments. The remainder comprised smaller numbers of groundstone tools, quartz artefacts used for making abrasive powder known traditionally in southeast Choiseul as *sauru*, a single obsidian flake as well as fragments of pumice and ochre. The rest of this section will be a discussion about key findings and interpretations presented in the chapter that contribute towards refining our understanding about the development of inter-communal interaction and craft specialisation in Manning Strait during prehistory. Interpretations made from the analysis of the chert are discussed first, followed by the geochemical characterisation of the obsidian and descriptive analyses of the groundstone and quartz artefacts.

Overall, the technological analysis of the chert demonstrated evidence of uniformity in the types of chert tools produced and core reduction techniques utilised in the Manning Strait region during prehistory. Retouched and non-retouched flakes were the most common type of stone cutting implement found in the region. This was the case for both the late Lapita intertidal sites, such as Kusira and Papatura, as well as for many of the late prehistoric inland ceramic and aceramic sites identified on Laena Island, Wagina and in the Arnavon Islands. Direct percussion applied to chert nodules or cortical fragments to create cores and flakes appears to have been the predominant method of tool production. This involved the use of hard hammerstones such as the specimen recorded from Wagina as well as soft hammerstones. Unifacial retouch, namely obtuse retouch from the ventral to dorsal surface, was demonstrated to have been most commonly practised, although bifacial retouch was occasionally observed. Serrated or denticulate edges were rare, and most of the retouch appeared shallow.

There were a few noticeable differences detected, however, in the size of flakes and cores found across the sites that may reflect behavioural patterns pertaining to resource maximisation and source proximity. Generally, it was found that the greater the proximity of the site was to Isabel, the larger the flakes and cores tended to be. For example, flakes collected on Laena Island, Wagina and Sikopo were, on average, about 30-50% smaller than those found on sites in northern Isabel. Similarly, cores found on Wagina were typically half the size of those recovered in the Isabel sites. There was also evidence of higher maximisation of chert cores in areas located further away from chert outcrops. This was exemplified by stark differences observed between cores from Wagina and the Mendana Bay chert quarry site.

Cores found on Wagina, where no chert sources are known, exhibited the highest number of flake scars, on average, and often appeared to have reached or to be near exhaustion. Additionally, about 75% of these cores were flaked in more than two directions (multidirectionally). In contrast, the Mendana Bay cores were typically the least exhausted and only 25% of them were flaked multidirectionally. The remaining 75% of cores from this site were flaked in a single direction and many appeared to have been flaked and discarded more wastefully. Although these behavioural patterns pertaining to resource exploitation resemble habitual examples of cost-benefit modelling (e.g. Surovel 2009; Torrence 1989), the issue of sample size needs to be acknowledged. Specifically, there was considerable variability in the number of cores and flakes found and examined between the assemblages which may have contributed towards the results.

Examination of the quality of chert collected from geological deposits located in Isabel and a wide distribution of archaeological sites in the Manning Strait region highlighted the near certainty of intra-regional movement of the material as well as the possibility of inter-regional importation. Cherts from uplifted marine limestone in northern Isabel generally appeared poor in quality. They contained more impurities and were typically chalkier compared to riverbed and limestone deposits located in the Central Solomons, specifically Malaita and the Makira/Ulawa region. Chert found on Ulawa and Malaita, which appear in a wide of range of colours although red and brown are common (Roe 1993: 178), have been described to have been of particularly high quality and to be extremely common (Ward 1976; Sheppard 1996: 108). A large, flaked riverbed cobble bearing very homogenous, red chert was found on Laena Island (Figure 8.2A) and it is believed here it is likely to derive from the Central Solomons. As there was extensive trading documented in the 'Eastern Triangle' between coastal communities in Makira, Ulawa, Malaita, eastern Guadalcanal, and reaching Florida Islands and southern Isabel (Belshaw 1950; Hogbin 1964), I consider it likely that high-quality chert from this region was occasionally reaching communities in Manning Strait at least as early as about three to two centuries ago. A combination of comprehensive sampling and trace element analysis, petrographic analysis and microfossil identification would a valuable place to begin to test this notion (e.g. see Ward and Smith 1974; Sheppard 1992, 1996; Brandl *et al*. 2018; Steuber 2018).

Geochemical characterisation of a single obsidian flake found at SIK-1 on the Arnavon Islands demonstrated that it originated from Kutau/Bao, located about 900 km away at Talasea in West New Britain. Prior to undertaking the chemical analysis, it was considered likely that the flake would derive from the Admiralty Islands as has previously been found for the few obsidian artefacts found in northwest Choiseul (Sheppard *et al*. 2015: 72-74) and other larger post-Lapita assemblages in the Northern Solomons and Bismarcks (Summerhayes 2004: 150-151; Spriggs 1991). The result of the chemical grouping was thus, to a certain extent, unexpected. However, given the extent of ethnographic exchange networks that interlinked parts of New Britain, Nissan, Buka, Bougainville, Shortland Islands and Choiseul (Blackwood 1935; Guppy 1887; Oliver 1967), the explanation of the flake reaching the Arnavons through down-the-line exchange is credible. Moreover, the temporal provenance of the flake coincides with an intensification in exchange, namely of pottery, argued to have arisen in the last 800 years in the Northern Solomons (Wickler 1990: 151).

The development of specialised production of shell valuables in the Western Solomons, which has previously been argued to have arisen in the last millennium (Thomas 2009), is supported also by some of the findings presented in this chapter. Specifically, the examination of the quartz files and *sauru* fragments from Laena Island in partnership with ethnographic documentation of traditional Choiseul shell money (Piko 1976), demonstrated a highly innovative example of exploitation of a local resource that is unique to the region. Moreover, the presence of red ochre alongside the quartz artefacts and their association with impressive shrine complexes highlight the ceremonial or *kastom* significance of shell-working on the island. In the ensuing chapter, shell-working and specialised production in the Western Solomons is discussed in more detail. This is done following a descriptive summary of the shell artefacts and faunal material recovered during field research in Manning Strait.

Chapter 9 Shell Artefacts and Faunal Remains

This chapter presents a descriptive summary of shell and coral artefacts recovered in Manning Strait as well as findings from an analysis of the excavated faunal remains. It is divided into four sections. The first and second sections describe the types of tools and ornaments identified from the assemblages. The third section summarises findings from a faunal analysis carried out on two excavated assemblages and explains the methodological procedure undertaken in the identification and quantification of the fauna. The two excavated assemblages derived from SIK-1 in the Arnavon Islands, dated to between 825-500 calBP, and WAG-4 on Wagina which was dated to 2300-2150 calBP. These assemblages are compared against each other to assess evidence of change over time in subsistence patterns. The chapter is concluded with a brief discussion about how findings from these analyses contribute towards expanding our understanding about the emergence of specialised production of shell valuables as well as long-term changes seen in subsistence practices in the Western Solomons.

9.1 Shell and Coral Tools

The shell and coral tools described here are considered to have primarily served utilitarian purposes in the past such as for wood and shell-working, food preparation and fishing. It is widely recognised in Island Melanesia, however, that the successful completion of many of these 'practical' activities were underlain by spiritual and ceremonial significance (e.g. Firth 1950; Spielmann 2002). In the Western Solomons, it has previously been argued that much of day to day life in late prehistory was inseparable from spirituality and the necessity to appease local spirits and gods (Walter *et al*. 2004; Sheppard and Walter 2006). Walter and Sheppard (2000: 316), for instance, have described habitation zones on Nusa Roviana as "ritually charged landscapes", and have demonstrated this through oral historical knowledge as well as by highlighting the prevalence of shrines and material offerings in the archaeological record. Therefore, it is important to acknowledge that many of the tools utilised in the Manning Strait region to prepare food, carvings or other material valuables used as shrine and grave offerings were an integral component of these social and spiritual processes.

Classification of the modified shell artefacts found in the Manning Strait region into tool 'types' follows conventional functional classification systems previously used in Island Melanesia (e.g. Specht 1969; Wickler 2001; Bedford 2006; Green and Walter 2011).

This form of classification places emphasis on showcasing the entire range of tools that were able to be identified as well as describing what they may have been used for and how they were manufactured. For each tool type, descriptions are given about its provenance and technological properties. At the end of the chapter, other important ecological and social factors are addressed pertaining to the production and distribution of these shell artefacts and how this may have influenced the growth of communities of practice within the Western Solomons.

9.1.1 Shell Adzes & Chisels

Five adzes, an adze preform, and a single chisel were recovered from surface surveys in Manning Strait. These included one complete and two unfinished adzes, made most likely from the dorsal region of *Tridacna maxima* valves, found at Apuseva Wall Complex(LAE-1) located in northern Laena Island (Figure 9.1A, D, F).

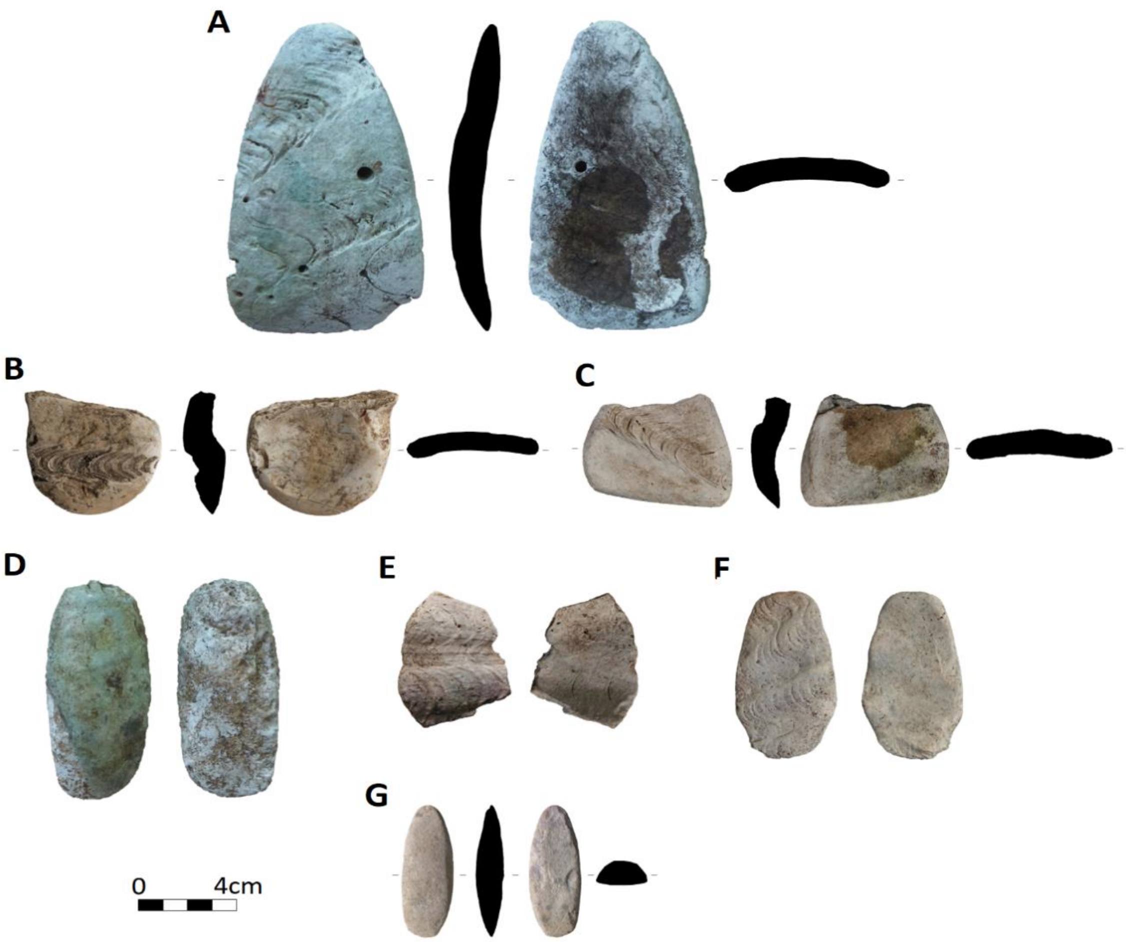


Figure 9.1 Finished shell adzes (A-C), adze preforms (D-F), and a single chisel (G) collected in Manning Strait.

The adze preform – made from a quite pronounced undulated Tridacna valve possibly belonging to *T. squamosa* or *T. maxima* - was found in a shrine complex located in Lynald's Plot (LAE-4) at the southern end of Laena Island (Figure 9.1E).

9.1.2 Scrapers and Knives

Five shell scrapers were recovered from SIK-1 (Figure 9.2). Four were flaked from Tridacna shell, most likely from near the hinge of the valve, and possessed usewear on their cutting edges. Three of these, specimens A-C, were found in Layer 1b of the 3 m^2 excavation, and specimen D on the surface of the site. The Tridacna scrapers were fairly robust, unlike specimen E which was manufactured from Pearl shell and was far thinner, suggesting it may have been utilised for finer cutting, slicing or shaving hair.

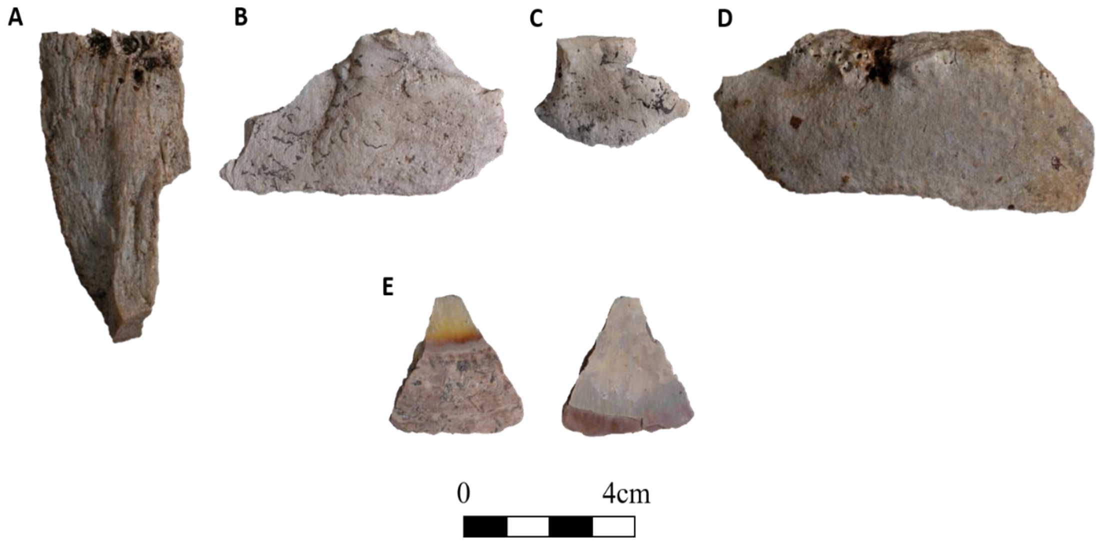


Figure 9.2 Shell scrapers manufactured from Tridacna shell (upper row) and Pearl shell (bottom).

In addition to the scrapers, seven Conus shell knives were recovered from the excavation of SIK-1 (Figure 9.3). The knives, which were found in both Layers 1b and 1c and were thus contemporaneous with both phases of prehistoric occupation of the site, measured on average 51.3 mm long, 13.5 mm wide, 3.4 mm at the thickest point and weighed 3.3 g. Their manufacture appears to have involved flaking of the Conus shell to create a rough out, followed by grinding to create a sharp cutting edge and to dull the opposite side of the blade. Some of the knives exhibited usewear and the very thin cutting edges suggested they were suitable for slicing flesh or other soft materials.

Figure 9.3 Conus shell knives recovered during excavation of SIK-1. Oriented with cutting edges facing left.

9.1.3 Files and Pounders

A large coral file and pounder were found on the surface of SIK-1 (Figure 9.4). The normally rough exterior of the coral fragments, most likely belonging to an Acropora species, had been smoothened. The file exhibited evidence of grinding longitudinally along its margin that is likely to have resulted from the grinding or polishing of shell. The pounder displayed patches of bruising indicative of repeated hammering, most likely of soft materials such as nuts. It may have also served well for breaking thin shell but was deemed too weak to flake the much thicker Tridacna valves found at the site.

A total of 60 smaller files fashioned from branches of Acropora coral and sea urchin spines were also recovered during the excavation of SIK-1 (Figure 9.5). The files were evenly distributed in the stratigraphy. They appeared relatively similar in size and, on average, measured 21.8 mm long, 6.5 mm at their thickest point and weighed 1.6 g. The entire body of the Acropora files appeared to have been used as the grinding surfaces. Whereas the sea urchin files were used like pencils, resulting in faceting usually at one of the tools, as has been found elsewhere in the Western Pacific (Bellwood & Dizon 2013: Fig. 8.13D).

Figure 9.4 Coral file (A) and pounder (B) found at SIK-1.

Figure 9.5 Acropora coral files (left) and sea urchin spine files (right) recovered from excavation of SIK-1.

9.1.4 Anvils

On Laena Island and Sikopo, several flat and modified slabs of coral were identified as anvils. One of these was found deposited on the largest coral mound shrine on Sikopo, Shrine F33 (SIK-3). It was deposited alongside Trochus and giant clam shell valves, some of which exhibited evidence of working. On Laena Island, highly modified coral limestone slabs were found at Apuseva Wall Complex (LAE-1) which served both as grindstones and anvils (Figure 9.6). Shallow circular hollows on these slabs were considered likely to have been used as nut anvil impressions or for drilling shell beads or discs. The deeper cavities may have also been used as mortars for crushing quartz to produce *sauru* powder.

Figure 9.6 Highly modified coral limestone slabs found at Apuseva Wall Formations (LAE-1) likely used for drilling, grinding and as an anvil.

In addition to the coral slabs, a thick semi-circular fragment of Tridacna shell found at LAE-1 was considered to be a possible anvil (Figure 9.7). It exhibited pecking and hammering along its circumference, and it resembled small circular anvils typically made from stone and used in the drilling of shell disc beads that have previously been recorded in Island Melanesia (Burley and Freeland 2019: Fig. 4a). No distinct depression was identified in the centre of the artefact, suggesting it may have instead been a broken preform of a shell ring.

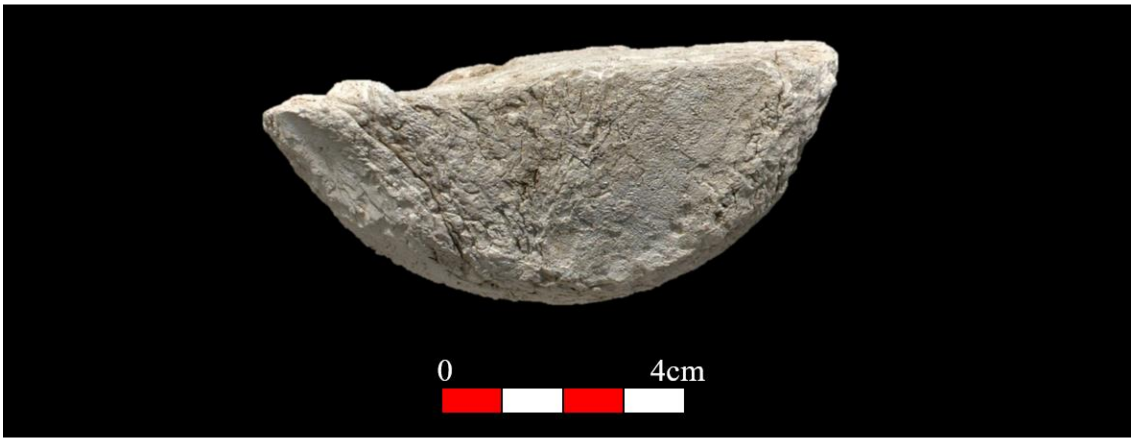


Figure 9.7 Possible Tridacna shell anvil found at Apuseva Wall Formations (LAE-1), Laena Island.

9.1.5 Fishing Net Weights

Fishing net weights manufactured from juvenile Tridacna valves were common finds on or near coral mound shrines on Wagina and Laena Island (Figure 9.8A). These artefacts, which characteristically exhibited a circular hole in the centre of the valve, have previously been recorded in the New Georgia group as offerings for fishing shrines (Nagaoka 1999: 65; Sheppard *et al.* 2000: 36). The valves appeared to have been punctured and the breadth of the hole roughed out or gently pecked using a hammerstone. This was followed by grinding of the inner circumference of the hole. In addition to the shell net sinkers, two large coral weights were found at the shrine complex, RSF 2 (LAE-4), on Laena Island. These may have been utilised as net sinkers, although the heaviness of the larger limestone coral weight suggested it may have also served as an anchor for a small dugout canoe (Figure 9.8B).

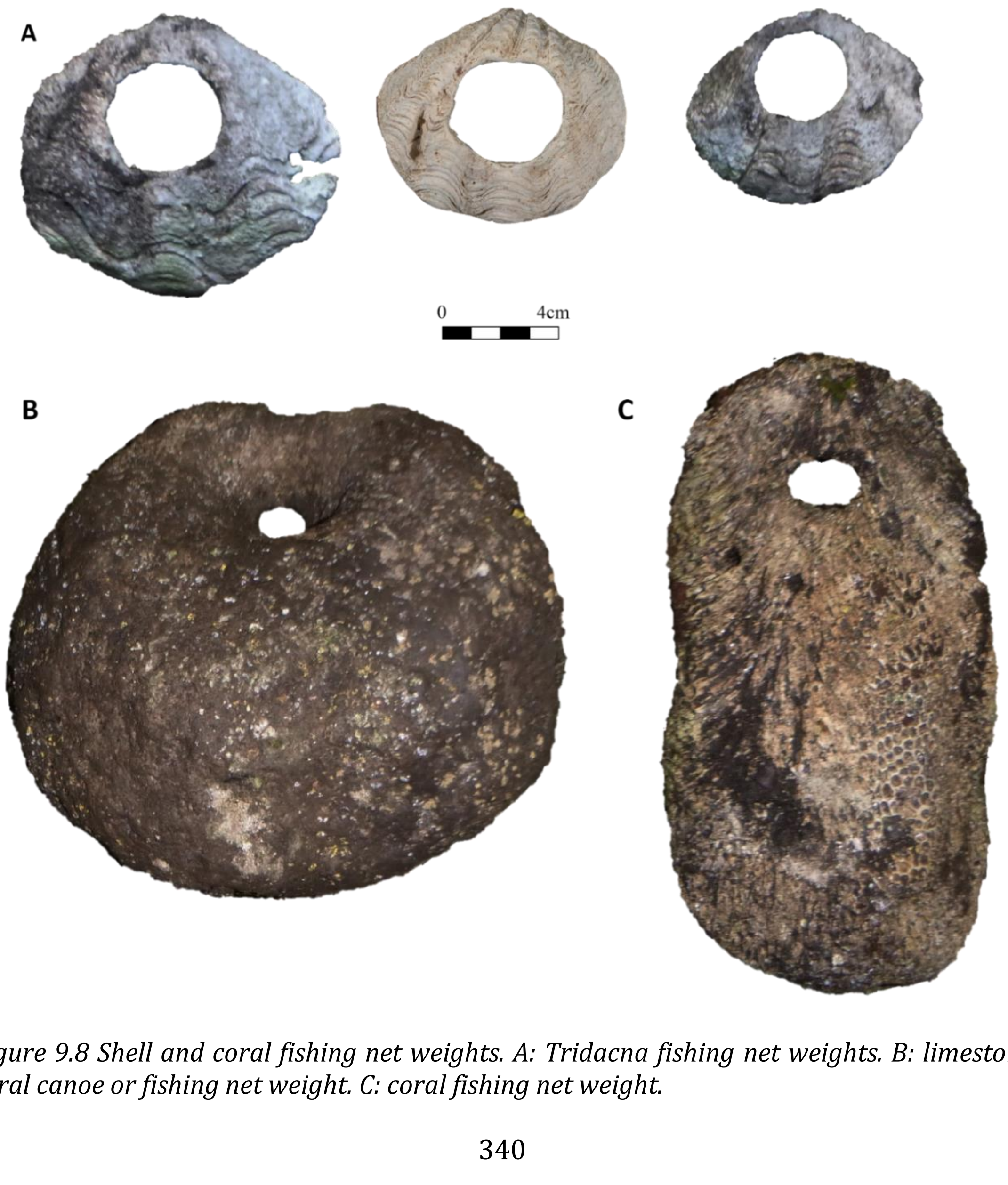


Figure 9.8 Shell and coral fishing net weights. A: Tridacna fishing net weights. B: limestone coral canoe or fishing net weight. C: coral fishing net weight.

9.1.6 Other Worked Shell Artefacts

Other modified pieces of shell recovered from the excavation of SIK-1 included a shell comb, Tridacna flakes and notched pieces of Trochus and Cowrie shell (Figure 9.9). The shell comb was thin and possessed a deeply serrated edge. It appeared to be a thin portion of its original size and was most likely manufactured from the whorl of a Conus shell or some other large gastropod. The shell flakes were struck from the hinge of a large Tridacna valve. They exhibited no obvious usewear or retouch and are considered likely to have been waste flakes created during the roughing out or shaping of thick hinge pieces. Three lip fragments of Trochus shell and a Cowrie whorl fragment exhibited modification in the form of single or consecutive notches. These may have been used for scraping vines used for lashing or were fishhook blanks.

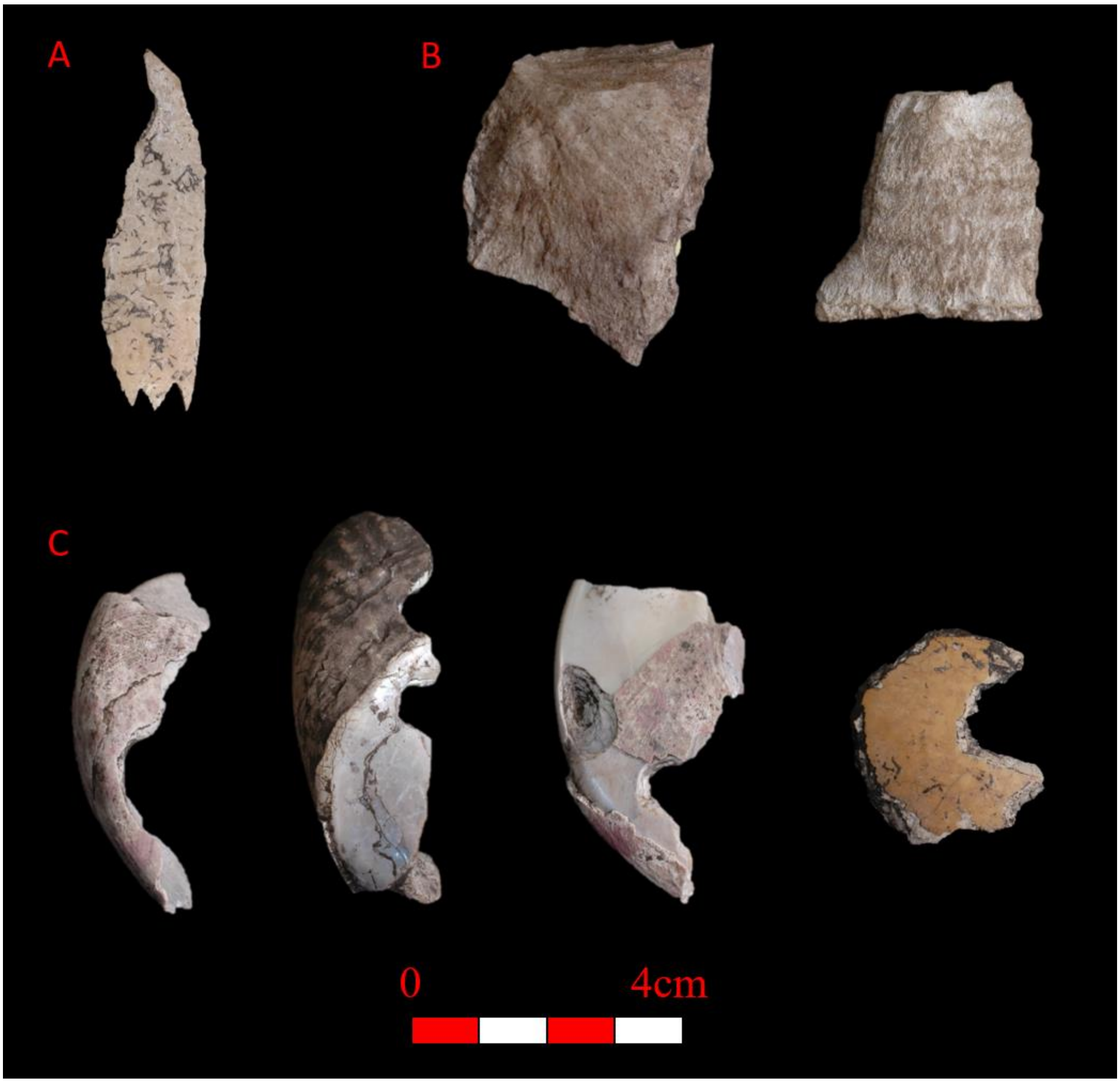


Figure 9.9 Miscellaneous worked shell artefacts. A: shell comb. B: ventral view of Tridacna flakes. C: notched Trochus and Cowrie shell.

9.2 Shell Ornaments

Decades of archaeological and ethnographic research carried out in the New Georgia group has contributed significantly to recording the vast array of shell ornaments traditionally made and exchanged in the Western Solomons (e.g. Aswani & Sheppard 2003; Sheppard & Walter 2014; Waite 1983; Thomas 2003). Unlike the large amount of literature that has documented this material culture from Roviana and the wider New Georgia group, far less has been written about shell ornaments made in Choiseul and Isabel. Most of the literature on this subject comprise ethnographic and indigenous accounts (Piko 1979; Scheffler 1965a; White 1991) and descriptive summaries of museum or personal collections (Tetehu 2014). Of the few archaeological accounts on this topic, some attention has been given to describing the manufacturing processes involved in making shell valuables (Miller 1979), their social and economic values, and evidence of their movement or exchange between communities in the recent past (Miller 1978). This is expanded upon in the descriptions given here of shell ornaments identified during surveying in Manning Strait.

The artefacts are classified and described in a similar manner to previous archaeological accounts of shell artefact assemblages recovered elsewhere in Solomon Islands (Green and Walter 2011; Wickler 2001). Emphasis is placed on grouping the artefacts according to traditional types known locally in southeast Choiseul where most of the artefacts were recovered (Piko 1976). For each type of ornament, images and brief descriptions are given about its provenance and technological properties.

9.2.1 Shell Rings

The most closely studied and well-known types of shell rings in the Western Solomons, or ‘shell money’ as they are known locally, are recognised by their Roviana names (Thomas 2003; Aswani and Sheppard 2003; Sheppard and Walter 2014). These include *bakiha*, which were preferably manufactured from fossilised Tridacna shell and adorned as pendants, *hokata* arm rings and *poata* ‘money-rings’ used specifically in exchanges (Sheppard and Walter 2014: 34-35). Other forms commonly found in the New Georgia group include *bareke*, a Tridacna ring that distinctively retained much of the original folds or undulations of the valve, and *bulau* and *hinuili* rings made from Conus shell (Thomas 2003: 168-169). For the remainder of this section, shell rings observed during field expeditions in Manning Strait will be described and compared against the Roviana shell money varieties. They are grouped into three types using

Avaso names described by Piko (1976) and by my informants in southeast Choiseul: *kesa*, *ziku* and *langono*.

Kesa

Kesa can be divided into two major classes based on their size and relational value according to Piko (1976: 96) and Scheffler (1965: 201). These include 'large kesa', which were highly prestigious and used in exchanges only as a last resort, and 'small kesa' called *tuekisa* which were used as a medium of exchange. Piko (1976: 96) further divided the large kesa into three types: *kalusape*, the most valuable of the kesa which were worth twenty *tuekisa*; *kalumiinava* which were valued at ten small *tuekisa*; and *kalulomma* which corresponded to five *tuekisa*. These sub-classes were only able to be identified and valued, Piko described, by expert appraisers.

Figure 9.10 Kesa fragments collected during surface surveying on Wagina (A) and Laena Island (B-C).

No complete kesa were excavated or found during surface surveys in Manning Strait. A single bundled set of three kesa, called *lupe kisa*, owned by a chief at Nuatambu were shown to me. He was not comfortable with them being photographed although they resembled kesa photographed by Miller (1979: Fig. 4.7A) and Piko (1976: 98). During field surveying in Manning Strait, a total of three fragments of kesa were collected on the surface of Eriton Stone (WAG-12) on Wagina and in Lynald's Plot (LAE-4) on Laena Island (Figure 9.10). These specimens appeared to be of the *tuekisa* class as they were several centimetres shorter and narrower than the large kesa. Distinctively, they were also ground flatter at their opposing ends which contrasted to the more pointed or convergent ends of the large kesa.

Two manufacturing techniques have been theorised for the production of kesa. Miller (1979: 83) argued from an examination of excavated and surface debitage he recovered at Nuatambu that hourglass pecking and grinding was performed to hollow out the rings. Piko (1976), conversely, theorised that *riku* vines were used to saw and hollow out kesa. From my observations of surface fragments at Nuatambu and Laena Island, there is more evidence in favour of kesa being manufactured using the hourglass pecking and grinding technique. Sawing was undeniably utilised on Laena Island and in wider southeast Choiseul for the manufacture of sarumbangara. However, unlike in the New Georgia group where sawn Tridacna circular cores were fairly common, no such artefacts were found during surveys in southeast Choiseul. This suggests that pecking and grinding may have been the most dominant form of shell ring manufacture in Choiseul while sawing was more prevalent in the New Georgia group. Further field research in Choiseul would be required, however, to test this notion.

Ziku

Arm bands and ornamental rings manufactured from Tridacna shell, known in Avaso as *ziku* or in Varisi as *jiku* (Craven 2019: 31), were one of the most common types of shell ornament found during site surveying in southeast Choiseul. They were only found on or near shrines and rarely were they found complete, most likely due to complete rings being targeted by looters. The depositing of broken *ziku* on shrines may reflect a practice observed on Nusa Roviana where *poata* were broken on shrines to mark the transferal of land rights or the movement of a community (Aswani and Sheppard 2003: 65). The entire range of *ziku* collected from surface surveys on Wagina and Laena Island and are exhibited in Figure 9.11.

These rings usually appeared plain (lacking any yellow or gold colouration) and possessed rectangular, square or plano-convex cross sections. The thinner *ziku*, examples A-C, closely resembled *hokata* whereas the thicker rings, illustrated by examples D and E, were nearly identical to *poata*. Ethnographically, *ziku* have been described to have served a similar function as *poata*, as money for "buying anything" or in compensation (Craven 1976: 27). They also appeared to have always been manufactured from giant clamshell as was the case for *hokata* and *poata* (Craven 1976: 11; Piko 1976: 101).

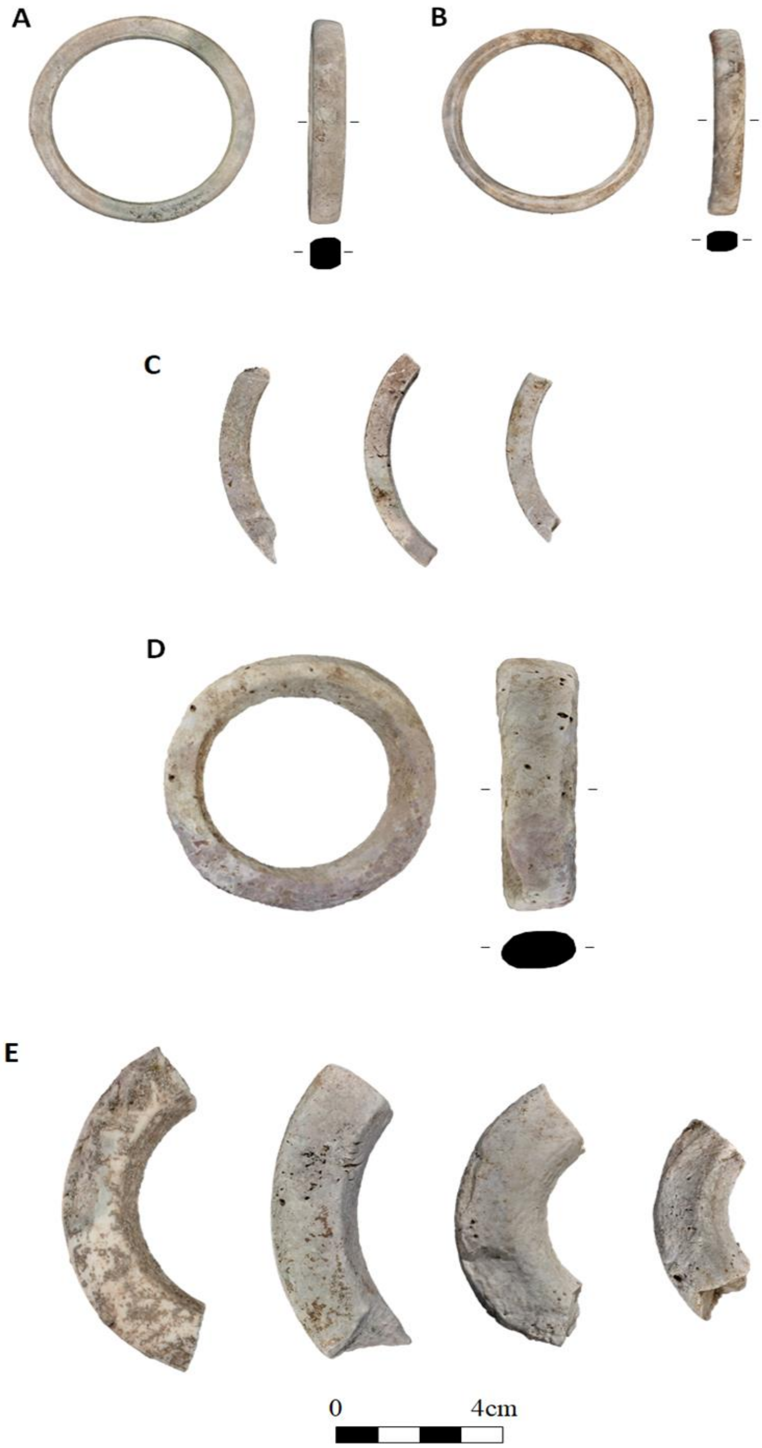


Figure 9.11 Ziku collected during field surveys in southeast Choiseul.

Langono

Another common form of shell ring encountered during field surveying in southeast Choiseul were rings made from Conus shell (Figure 9.12). These rings are named here after the Varisi word for cone shell, *langono* (Craven 1976: 1). In appearance, these rings were virtually identical to *bulau* and *hinuili* rings found in the New Georgia group. The largest number of complete *langono* rings were found at Apuseva Hilltop (LAE-2) (Figure 9.14), and they were occasionally seen at most shrine sites on Wagina, sometimes hidden within coral box chambers. In similar fashion to *bareke*, the *Conus* shell rings were more variable in their degree of grinding and size. They were manufactured firstly by detaching the base of the cone shell, puncturing a hole in the middle of the detached disk and then were ground. Specimen A is an example of a complete Conus ring, that noticeably has not been ground completely smooth, and specimen B is a preform that had been split possibly during the puncturing of the central hole.

Figure 9.12 Langono shell rings collected during surveying in Manning Strait.

9.2.2 Shell Fretworks

Intricate fretworks manufactured from Tridacna shell, known as sarumbangara in Avaso, were found on Wagina and Laena Island. Also known as *mbarava* or *porobatuna* in Roviana (Thomas 2003: 215), sarumbangara were highly revered and, unlike shell money, are not known to have been used as a medium of exchange. Piko provides one of the most detailed descriptions of sarumbangara:

> *Sarumbangara is the name given to it by the old people to indicate the maker of these relics. It was Mbangara (sea god) who made them ('saru', to make)… The sarumbangara… was always kept in tombs or shrines where skulls of the old tambu people (seama) were kept secure*

> *on their own ancestral land or islands… The term 'seama' referred to priests or mediums who could understand what the mbangara or the gods said or wanted. Seama were the people who attended to the mbangara; they gave them the first fruits of the land or made sacrifices to them of pigs or puddings (Piko 1976: 104-5).*

Piko (1976: 106-7) also described how he believed sarumbangara were made. The first step involved hammering or removing unwanted parts of the shell followed by grinding to shape the shell chunk into a slab. Once the required shape and thickness had been obtained, the design was marked out and then holes were drilled at intervals within the design field (Figure 9.13). The final and most demanding step involved the use of well-matured aerial roots of a bush creeper, known as *riku*, to saw or carve out patterns within the plaque. He called this process the *pisupisu* method which referred to the action of pulling back and forth. Similar sawing techniques have been described for shell working in Roviana (Hocart n.d.: 1; Thomas 2003: 174).

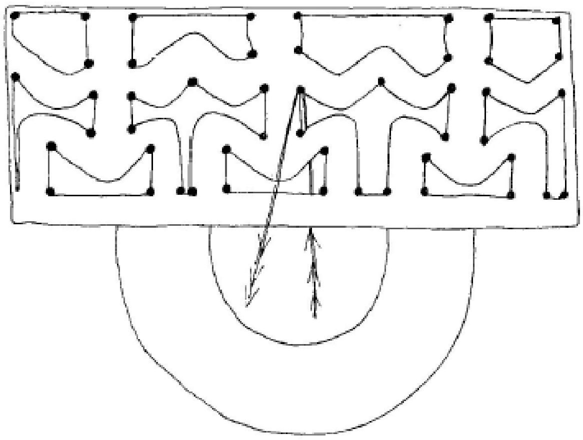


Figure 9.13 'Pisupisu': sawing process involved in the making of sarumbangara (Piko 1976: 107).

During the field surveys in Manning Strait, two slightly broken sarumbangara were found at a cave burial site (WAG-5) located approximately 1.6 km north of Kukutin on Wagina. They were found hidden behind rocks that had been stacked at the mouth of a small natural limestone chamber beside the remains of at least one individual (pictured in Figure 5.29). Given Piko's descriptions about sarumbangara, the buried individual was considered likely to be an individual of high social status, perhaps a chief or *seama*, and an indigenous inhabitant of Wagina who possessed an ancestral connection to the island. Similarly styled fretworks to these two sarumbangara have been collected from Wagina and Choiseul in the past, supporting they were most likely made locally or elsewhere in Choiseul (Waite 1983: Plates 3, 5).

On Laena Island, six fragments of sarumbangara were found on the surface of shrine complexes at Lynald's Plot and Apuseva. Three pieces were found at Lynald's Plot (LAE-4) within the smaller of the two rectangular coral slab shrine structures, RSF 1. They were of a similar thickness, suggesting they may have been offcuts or fragments of a broken individual fretwork that were deliberately broken and placed on the shrine (see Waite 1983: 68). At the hilltop at Apuseva, two large sarumbangara fragments were found hidden beneath coral slabs alongside a range of shell rings (Figure 9.14). Interestingly, the largest fragment exhibited thin notches along one of its edges that were most likely created using *riku*. It also possessed thin and shallow engraved lines on one of its surfaces which were considered to likely be design markings that had not yet been sawn.

Figure 9.14 Two sarumbangara fragments, one with a notched edge (far right), and other shell ornaments found at Apuseva Hilltop (LAE-2).

9.2.3 Shell Beads and Pendants

Several shell beads and pendants were recovered during the field research. On Sikopo, a single shell money bead, a possible shell money bead blank, and a ground prismatic fragment probably made from Tridacna shell were recovered from the excavation of SIK-1 (Figure 9.15). The shell money bead measured 6 mm wide and 2 mm thick, and was found in Layer 1b of the excavation thus aligning it with the second phase of occupation of the site dated to 625-500 calBP. The ground prismatic fragment measured 30 mm long and 5 mm thick and was found in Layer 1c which was dated to

825-700 calBP. Its elongated and polished body suggest it may have been worn as a nose pin or it may be a pendant that had not yet been drilled.

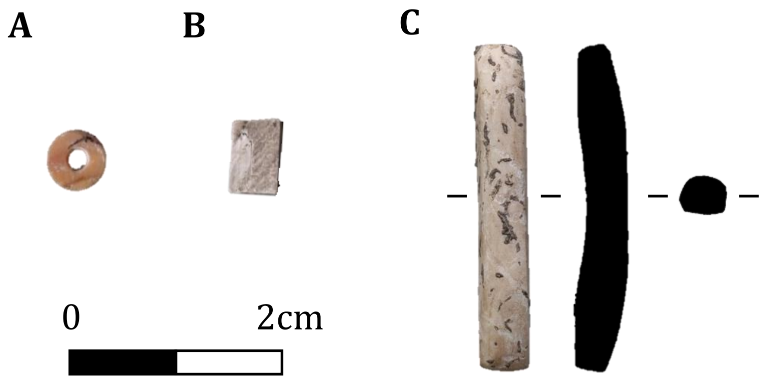


Figure 9.15 Shell money bead (A), possible bead blank (B) and ground prismatic ornament (C) excavated on Sikopo.

On Laena Island, a slightly larger shell bead and two pendants were found on the surface of Apuseva Hilltop (LAE-2) (Figure 9.16A,B). The shell bead was manufactured from Conus shell and measured 19.2 mm wide and 3 mm thick. The pendants, one of which is not illustrated as it was left on site, were also manufactured from Conus shell. A complete, decorated pendant made from Tridacna shell was collected on Wagina (Figure 9.16C). It was found on the surface of a small coral mound shrine near Koura's Garden (WAG-11) located on a ridgeline behind Kukutin. It measured 76.8 mm in length, 8.6 mm wide and 6.6 mm thick, and exhibited a common zig-zag motif engraved on its face (e.g. see Walter and Green 2011: Fig. 6.1).

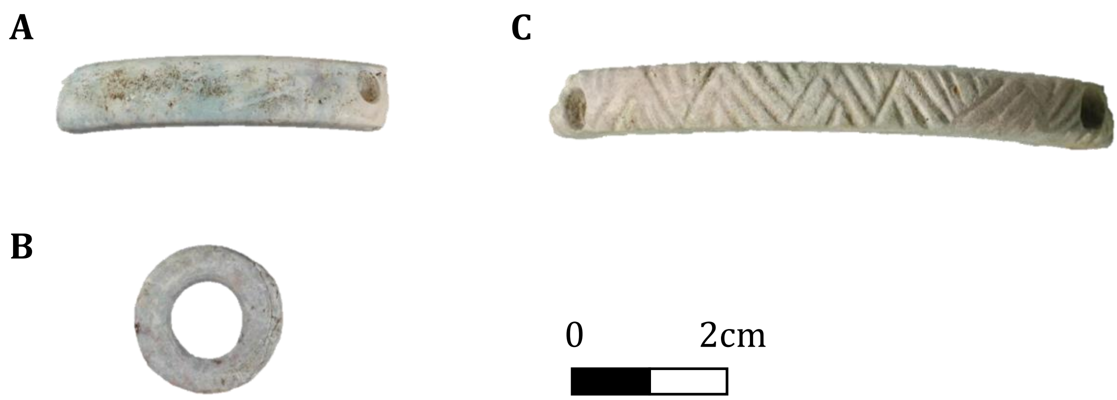


Figure 9.16 Shell bead and pendants found on Laena Island (left) and Wagina (right).

9.2.4 Shell Combs

Two Tridacna combs were also found at Apuseva Hilltop (LAE-2) on Laena Island. The combs, which are a smaller form of the shell fretworks known as *pagosia* in Roviana (Thomas 2003: 195), were found alongside a single bakiha and were hidden beneath a small coral box-shaped chamber located at the top of hill (Figure 9.17). Shell combs have been recorded in northwest Choiseul and it is possible these examples were either manufactured locally on Laena Island or were originally made in the New Georgia group.

Figure 9.17 Tridacna combs and bakiha found in coral box chamber at Apuseva Hilltop (LAE-2), Laena Island.

The presence of bakiha, a characteristically Roviana shell valuable, on the island was a surprising find for the local landowners. Although, given the abundant evidence of head-hunting raids being launched into the Manning Strait region during the mid to late-nineteenth century and the radiocarbon age of this part of Laena Island to within this timeframe, the artefact may have originally derived from Roviana but reached Laena Island through some manner of transportation. For example, through either exchange, looting carried out by head-hunting parties from southeast Choiseul or payment by Roviana chiefs to Laena Island occupants to participate in a raid. Ethnographic descriptions of Laena Island as a "rock fortress" used in defence during raids support some form of engagement of Laena Islanders in head-hunting (Bogesi 1950: 3/4).

9.3 Faunal Analysis

Faunal remains, namely small clusters of shellfish and pieces of fish bone, were commonly observed during surface surveying in the Manning Strait region. They were often found near shrines where they were likely to have been discarded as offerings and occasionally appeared alongside pottery and chert scatters on ridgelines and in caves. Two faunal assemblages were recovered during excavations carried out in the Arnavon Islands and on Wagina, and these are the focus of the faunal analysis. Little attention is given here to investigating specific dietary information about the prehistoric communities who created the midden deposits (e.g. calorific intake). The analysis is more generally directed by the following two objectives:

1) To identify the range and relative abundance of taxa within the excavated assemblages in order to investigate the nature of human-environmental interactions evident in the archaeological record.
2) To identify changes in these ecological relationships and subsistence strategies through time that may demonstrate evidence of environmental change or altering adaptations in subsistence behaviours.

The remainder of this section provides a close examination of the two excavated faunal assemblages and discusses how the results expand upon our understanding about prehistoric subsistence activities of communities living in the Manning Strait region. Before this is done, however, an overview of the two excavated faunal assemblages will be given and the methodical approach taken in this study will be explained.

9.3.1 Overview of Faunal Assemblages

The two faunal assemblages comprised abundant amounts of marine and mangrove shellfish as well as varying amounts of fish, mammal, reptile and bird bone (Table 9.1). The largest assemblage was gathered from a 3 m^2 excavation carried out at Area A (SIK-

1) on Sikopo, Arnavon Islands. This deposit contained a wide range of material culture including incised and impressed ceramic ware, stone and shell artefacts, and was likely to have accumulated following two separate phases of occupation dated to 825-700 calBP and 625-500 calBP. The bulk of the shellfish recovered from the deposit was counted and measured before being left on-site due to transportation limitations. Thus, the total weight of shellfish from SIK-1 listed in Table 9.1 was estimated based on average weights of species analysed in the lab. Additionally, the similarity in shell NISP values between the assemblages is due to a high degree of fragmentation of the Fly Cave shell material which was able to be counted in the lab.

Table 9.1 Total NISP and weight of major faunal classes from the two midden deposits excavated on Sikopo (SIK-1) and Wagina (WAG-4).

Fauna	**SIK-1**		**WAG-4**	
	NISP	*Weight (g)*	*NISP*	*Weight (g)*
Shell*	1028	161,787.2	924	2,251.5
Crab	74	11.1	9	4.6
Fish	5554	941.8	151	47.4
Reptile	108	58.4	8	3.9
Bird	54	4.3	18	3.4
Mammal	16	1	68	29.2
Total	6834	162,803.8 (162.8 kg)	1178	2,340 (2.34 kg)

*Including sea urchin fragments

The smaller assemblage derived from a 1 m^2 excavation that was carried out at Fly Cave (WAG-4) located on Wagina. This excavation produced mainly faunal remains, except for a single piece of pumice and a possible Conus shell ring fragment. The stratigraphy and radiocarbon dating indicated an initial short-lived period of occupation dated to between 2300-2150 calBP. Before these assemblages are examined in more detail, the methods utilised in identifying and quantifying the taxa will be explained.

9.3.2 Methods

Analysis of the excavated faunal remains was carried out at Otago Archaeological Laboratories (OAL), and the methodological procedures undertaken in this process are described in three sections. The first describes the sampling strategies utilised in the recovery of the excavated faunal remains, and explains what parameters guided the selection of analytical units used to organise the faunal data. The second and third sections describe the processes of identification and quantification of the assemblages, respectively. After these sections, results for each of the faunal assemblages are given.

Sampling and Analytical Unit

All faunal artefacts were returned to OAL except for the Sikopo excavation where large shellfish, namely large amounts of Trochus and heavy valves and chunks of Tridacna shell, were left on site due to limitations with artefact transportation. These were reburied in the process of backfilling after they had been counted and measured according to their associated spit. The analytical units used to organise the faunal data, referring specifically to the distribution of NISP and MNI counts, are based on stratigraphic layers identified from the excavation. Preference was given to layers instead of spits as they corresponded more effectively to the unique nature of occupation of each site, important archaeological features identified in the stratigraphic profiles and the radiocarbon dating results.

Identification

Identification of taxa was carried out using reference collections at OAL of tropical Pacific fish (Walter *et al*. 1996) shellfish and turtle, as well as mammals, birds and reptiles found in New Zealand and much of the wider Pacific. Prior to identification, all bone and shell were cleaned, dried and sorted into their primary faunal classes: fish, bird, mammal, reptile and shell. Specimens in each class were then sorted into non-diagnostic fragments and diagnostic anatomical portions or 'elements' (Grayson 1984; Hesse & Wapnish 1985; Leach 1986). Only the elements, which typically represented a small proportion of the samples, were then attempted to be identified to the lowest possible taxa.

For the identification of shellfish taxon, the diagnostic elements used were basic anatomical features of gastropod and bivalve molluscs (e.g. Claasen 1998, 2000). For fish, the selected elements included five paired cranial bones - dentary, premaxilla, maxilla, articular and quadrate - and various 'special bones' described by Leach (1986). These portions were selected as they have been demonstrated to be the most effective method of identification and quantification of fish in the Pacific region (Leach 1986: 152; Leach & Davidson 1981; Leach & Ward 1981). For the mammal and reptile remains, individual bones belonging to the skeleton of the certain animal were treated as individual elements. Bird bones proved to be the most difficult to identify to a taxon due to a limited range of tropical Pacific bird species available in the OAL reference collections. Preliminary identifications were made for this faunal class using textual and online references which are cited in the results.

Quantification
Quantification of the faunal remains was practised following standard zooarchaeological procedures (Baker *et al*. 2010). This involved calculating the number of identified specimens (NISP), the minimum number of elements (MNE) and minimum number of individuals (MNI) for each faunal class. Each of these methods is briefly described below. All faunal specimens were weighed; however, weight was not utilised as a measure of relative abundance due to the considerable variability in the weight of the individual shellfish and vertebrate species that were under examination.

NISP (Number of Individual Specimens Present)
NISP represents a direct count of the number of fragmented or complete units of shell or bone that can be attributed to a particular taxonomic group. As this method does not take into account issues of fragmentation and thus can produce inflated totals (e.g. a NISP of five maxilla could represent five complete maxilla or five fragments of one), it was used in combination with MNE and MNI.

MNE (Minimum Number of Elements)
MNE represents the minimum number of elements or diagnostic anatomical portions that are required to account for a NISP value. Unlike NISP, this method is designed to allow for fragmentation (Lyman 2008). Although it also relies more heavily on the competence of the archaeozoologist to identify potential unique landmark features that can assist in calculating MNE.

MNI (Minimum Number of Individuals)
MNI is calculated from MNE and represents the minimum number of individual specimens required to account for a faunal assemblage. For example, if an MNE of three right maxilla and one left maxilla of a parrotfish were calculated, the MNI of this species would equate to three as a single parrotfish possesses only one left and right maxilla.

9.3.3 Arnavon Islands: SIK-1 Excavation
Results from the analysis of shellfish, fish, reptile, mammal and bird remains found in the excavation of SIK-1 are given in the following sub-sections.

Shellfish

Results from the counting and measuring of Trochus shell and giant clam shell valves found in the excavation are presented in Tables 9.2 and 9.3, respectively. *Trochus niloticus* was the most abundant species of shellfish represented in the entire midden sample. *Trochus maculatus* was occasionally identified although was nowhere near as abundant. Notably, about 45% of the total number of Trochus shells were recovered in Spit 2 within Layer 1b amongst dense 'shell heap' features. Their number drastically decreased as the shell heaps became indistinguishable in Layer 1c. Interestingly, the average size of the Trochus increased by approximately 12% from the first to second phase of occupation of the site. These differences in quantity and size of the Trochus between the two phases of occupation demonstrate more intensive harvesting was carried out in the second phase and that larger Trochus were targeted.

Table 9.2 MNI and average width and height measurements of Trochus shell found in SIK-1 excavation. Measurements in cm.

Layer	Spit	MNI	Average Width	Average Height
1b	2	319	8.07	6.92
	3	165	7.4	6.66
	4	135	7.45	6.71
1c	5	34	6.68	6.09
	6	59	6.93	6.43
Total		712	7.31	6.56

Table 9.3 MNI and average length and width measurements of giant clam shell found in SIK-1 excavation. Measurements in cm.

Layer	Spit	MNI	Average Length	Average Width
1b	2	23	15.1	9.9
	3	31	13.35	8.61
	4	9	13.95	9.51
1c	5	6	12.21	8.11
	6	22	12.91	8.69
Total		91	13.50	8.96

In similar fashion to the stratigraphic distribution and size differences of the Trochus shell, giant clams were found in their highest abundance and were at their largest in size in Layer 1b (Table 9.3). *Hippopus hippopus* was the most plentiful species. It was found in its highest proportion in Layer 1c, accounting for about 84% of the MNI calculated for this context. Other identified Tridacna varieties included *T. maxima*, *T. squamosa, T. crocea*, *T. derasa* and *T. gigas*. The thickest and largest *T. gigas* were found in Spit 2 of Layer 1b, as is demonstrated by the greatest average valve length and width recorded for that context.

In addition to Trochus and giant clam shells, a wide range of mangrove, beach, reef and benthic shellfish species were identified from the midden assemblage (Table 9.4). Shellfish remains recovered in Layer 1a are not displayed in the table as they amounted to a small total NISP of 14, of which only three specimens were identified to species. These included two whole *T. niloticus* shells and a fragmented *Turbo petholatus* shell. The few diagnostic shellfish remains (MNE=2) collected from Layer 2 are not included and no shellfish was bagged from Layer 3.

Table 9.4 MNI counts of shellfish species identified from SIK-1 excavation.

Taxon	**Layer 1b**			**Layer 1c**		**Count**
	Spit 2	*Spit 3*	*Spit 4*	*Spit 5*	*Spit 6*	
Architectonicidae ?sp	1	-	-	-	-	1
Conus sp.	3	-	1	-	-	4
C. imperialis	1	7	1	1	8	18
C. tessalatus	1	-	-	-	-	1
Terebralia palustris	2	10	14	2	16	44
Cassis cornuta	3	1	-	-	-	4
Veneridae ?sp	-	-	-	1	-	1
Spondylus sp.	-	2	-	1	3	6
Lambis truncata	3	4	4	-	13	24
Lambis scorpius	-	1	1	1	3	6
Pleuroploca trapezium	1	12	8	2	11	34
Mitra mitra	-	-	-	1	-	1
Pinctada sp.	3	1	-	-	-	4
P. margaritifera	-	1	1	-	5	7
P. maxima	-	1	1	1	-	3
Cypraeidae sp.	1	2	2	1	4	10
Lyncina aurantium	-	-	-	1	-	1
Turbinidae ?sp	6	2	4	5	2	19
Turbo petholatus	1	-	1	-	-	2
Total	**25**	**44**	**39**	**18**	**65**	**191**

For both Layers 1b and 1c, the most abundant type of shellfish were marine species, namely large conches as well as cone shells, cowrie shell and turbo shells. The Giant Mangrove Whelk (*Terebralia palustris*) was the highest represented species and accounted for approximately 23% of the total MNI. The larger-growing marine cone shell, *Conus imperialis*, also represented a sizable part (9.5%) of the sample. Of the conch shells, the Trapezium Horse Conch (*Pleuroplaca trapezium*) was the most abundant species, representing about 18% of the sample. 'Cat's eye' operculum, belonging to Turbinidae sp. sea snails, were found throughout the stratigraphy and formed about 11% of the sample. Other shellfish remains identified in Layers 1b and 1c included pearl shell, specifically the Black Lip (*P. margaritifera*) and Gold Lip (*P. maxima*) varieties which today are harvested in nearby coastal villages, as well as spondylids. Fragments of the blunt spikes of the sea urchin, *Phyllacanthus imperialis* (NISP= 6), and Chiton plates (NISP=13) were also found throughout the stratigraphy.

Fish

A total of 5,554 fish bones, weighing about 0.94 kg, were collected from the excavation. Approximately 89.3% (fragments = 4960; elements = 9) of these were not able to be identified to a family or species. The nine unidentified elements were highly fragmented. The remaining 10.7% (N=594) of the fish bone was identifiable to a fish family or species and, of these, 349 elements possessing landmark features were used in the calculation of MNE and MNI. These MNE and MNI values are listed in Table 9.5 in accordance with their stratigraphic layers. Layer 1a, which contained three elements belonging to Scaridae and Diodontidae, was not included in the table.

Table 9.5 Fishbone MNE and MNI values calculated for SIK-1 excavation, Arnavon Islands.

Taxon	Common Name	Layer 1b		Layer 1c		Layer 2		Layer 3	
		MNE	*MNI*	*MNE*	*MNI*	*MNE*	*MNI*	*MNE*	*MNI*
Scaridae	Parrotfish	55	13	16	7	1	1	-	-
B. muricatum	Green Humphead Parrotfish	10	4	1	1	-	-	-	-
Labridae	Wrasses	13	6	24	12	4	1	1	1
Serranidae	Groupers, Sea Basses	16	5	25	7	3	1	6	2
Lutjanidae	Snappers	24	7	13	4	1	1	6	3
P. auratus	Australasian Snapper	1	1	-	-	-	-	-	-
Balistidae	Triggerfish	25	3	29	3	-	-	-	-
Lethrinidae	Emperors	10	3	8	2	5	2	7	2
M. grandoculis	Humpnose Big-eye Bream	2	2	3	1	-	-	1	1
Carangidae	Mackerel, Kingfish	7	3	5	2	-	-	1	1
Diodontidae	Porcupinefish	1	1	8	1	-	-	2	1
Kyphosidae	Sea Chubs	1	1	-	-	-	-	1	1
Holocentridae	Squirrelfish	-	-	-	-	-	-	1	1
Acanthuridae	Surgeonfish	7	3	2	1	-	-	-	-
Elasmobranchii	Shark/ray	2	1	1	1	-	-	-	-
Muraenidae	Moray Eel	-	-	1	1	-	-	-	-
TOTAL		**174**	**53**	**136**	**43**	**14**	**6**	**26**	**13**

A higher number of fish was identified in Layer 1b compared to Layer 1c. The MNI value calculated for Layer 2, a thin forest soil layer identified above the natural marine sand, is likely to be influenced by fish remains mixing from Layer 1c. The low MNI, however, may also indicate evidence of initial low intensity settlement of this part of Sikopo dating to the earliest range of the radiocarbon record (850 calBP).

Comparing the abundance of the various types of fish caught during the first and second phases of occupation of the site, four families of fish appeared dominant (Figure 9.18). These included Scaridae and Serranidae which typically inhabit the inner reef zone and are easily caught by netting. The other two were Labridae and Lutjanidae which are mostly benthic feeders found in both the inner and outer reef zones that are commonly fished using angling. For Layer 1c, Labridae was the highest represented, accounting for 27% of the total MNI for that layer. Whereas for Layer 1b, Scaridae was the highest represented, forming 29% of the MNI for that layer. Other noticeable differences included a higher proportion of Lutjanidae and topa identified in Layer 1b than in Layer 1c, which indicates that larger fish may have been actively targeted during the second phase of occupation. The identification of a moray eel and vertebra of a shark or sting ray may also suggest engagement in trapping and spearfishing.

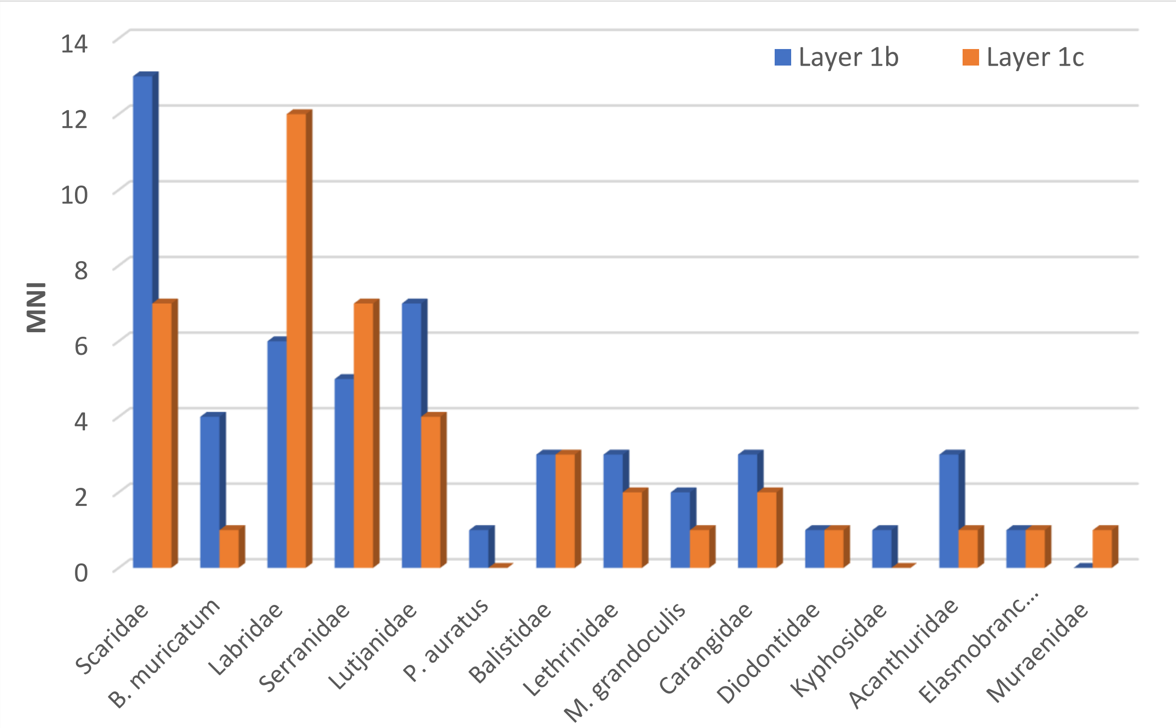


Figure 9.18 MNI values of fish identified in Layers 1b and 1c of the excavation of SIK-1.

Reptiles, Mammals, and Birds

Results from the identification of reptile, mammal and bird remains are given in Table 9.6. Marine turtle formed the second highest proportion of bone remains after fish. A total of 107 fragments were identified, although approximately half of these were small pieces of turtle shell. There was no clear indication of a high number of turtles being hunted and consumed at the site, as is demonstrated by the low MNI values. The species represented by the remains was most likely Hawksbill Turtle (*Eretmochelys imbricata*). Green Turtle (*Chelonia mydas*), which also nest in the Arnavon Islands but in far fewer numbers than Hawksbill (Ramohia 1992), cannot be ruled out as being represented in the assemblage.

The only mammal identified among the faunal remains was the Pacific Rat (*Rattus exulans*). Rat remains were present throughout the stratigraphy, including in Layer 1a which contained an MNI of one rat. Rat remains were most concentrated, however, in Layers 1b and 1c. Burrowing of modern Pacific Rats, which are present in the island group, is possible although it is considered more likely that rat was brought unintentionally or as a food source during the earliest phase of occupation of the site.

Table 9.6 NISP, MNE and MNI values of reptile, mammal and bird identified in SIK-1 excavation.

Taxon	Layer 1b			Layer 1c			Layer 2			Layer 3		
	NISP	*MNE*	*MNI*	*NISP*	*MNE*	*MNI*	*NISP*	*MNE*	*MNI*	*NISP*	*MNE*	*MNI*
Turtle	48	8	1	48	3	1	5	-	-	6	3	1
Rat	5	5	2	8	6	3	1	1	1	1	1	1
Bird	10	3	1	30	17	2	2	-	-	12	4	1
Total	**63**	**16**	**4**	**86**	**26**	**6**	**8**	**1**	**1**	**19**	**8**	**3**

Of the bird remains, two distal coracoid portions found in Layer 1b resembled parakeet and kingfisher specimens available in the OAL reference collection. Other bird species known to be residential breeders in the Arnavon Islands that may be represented in the assemblage include the Melanesian Megapode (*Megapodius eremita*), Nicobar Pigeon (*Caloenas nicobarica*), and the Island Imperial Pigeon (*Ducula pistrinaria*) or locally named 'Kurukuru'. Confident identification of bird species was made difficult due to the high fragmentation of the fragile remains. Bat was only identified in the nearby cave, Lianga Tafa (SIK-3).

9.3.4 Wagina: WAG-4 Excavation

Results from the analysis of shellfish, fish, reptile, mammal and bird remains found in the excavation of Fly Cave (WAG-4) are given in the following sub-sections.

Shellfish

A wide range of predominantly mangrove and, to a lesser extent, beach and reef shellfish species were identified (Table 9.7). Within the first metre of the deposit, specifically in Layers 3 and 7, a small quantity of shellfish was identified. These included the only Chiton and *H. hippopus* recovered in the assemblage.

Table 9.7 MNI counts of shellfish identified from WAG-4 excavation.

Taxon	Layer 3	Layer 7	Layer 9	Layer 10	Count
Arcidae ?sp	-	-	1	-	1
Anadarra antiquata	-	1	1	-	2
Architectonicidae ?sp	-	-	5	-	5
Batillaridae ?sp	-	-	4	-	4
Chiton	1	-	-	-	1
Cymatiidae ?sp	-	-	1	-	1
Littorinidae ?sp	-	-	2	-	2
Neritidae ?sp	-	-	2	-	2
Nerita articulata	1	-	6	4	11
Neritina adumbrata	-	-	16	4	20
Neritodryas cornea	-	2	20	8	30
Ostreidae ?sp	-	-	1	-	1
Oxymeris ?sp	1	-	7	-	8
Pinctada ?sp	-	-	2	-	2
Polymesoda ?sp	-	2	44	19	65
Pythia scarabaeus	-	-	15	-	15
Strombidae ?sp	-	-	1	-	1
Terebralia palustris	1	-	16	7	24
Thiaridae ?sp	-	-	-	4	4
Tridacna gigas	-	-	1	-	1
Hippopus hippopus	-	1	-	-	1
Trochus fenestratus	-	-	1	-	1
Trochus maculatus	-	-	1	-	1
Trochus niloticus	-	-	5	1	6
Turbinidae ?sp	-	-	1	1	2
Turbo setosus	-	-	-	1	1
Gafrarium ?sp	-	-	6	-	6
Vasum turbinellus	-	-	1	-	1
Total	**4**	**6**	**160**	**49**	**219**

Focusing on the earliest cultural deposit represented by Layers 9 and 10, mangrove clams from the genus Polymesoda, most likely *P. expansa* or *P. erosa* which are referred to as *keu* in the Zabana dialect of Isabel (Carter 2014), were the most abundant type of shellfish. They accounted for 30.2% of the total MNI. This was followed by Nerites, also known as Necklace Shells, and the mangrove auger shell species *Terebralia palustris* which is known locally as *meko*. Both marine and freshwater Nerites were identified, and these accounted for 28.8% of the total MNI. While meko comprised 10.9%. Other saltmarsh and freshwater species identified in the assemblage included Pythias, Thiarids and Venus clams of the Gafrarium genus. The largest shellfish varieties included Trochus and a single thick *Tridacna gigas* hinge fragment.

Fish

A total of 151 fish bones weighing a total of 47.4 g were recovered from the excavation. Approximately 80.8% (111 fragments; elements = 11) of these were unable to be identified to a family or species. The 11 unidentified elements included vertebra and a fragmented tooth. A remaining 29 elements were identified to a family or species and their MNE and MNI values are listed in Table 9.8.

Table 9.8 Fishbone MNE and MNI values calculated for WAG-4 excavation, Wagina.

Taxon		**Layer 9**		**Layer 10**	
		MNE	*MNI*	*MNE*	*MNI*
Scaridae	Parrotfish	9	3	4	2
Carangidae	Mackerel, Kingfish	1	1	-	-
Labridae	Wrasses	1	1	1	1
M. grandoculis	Humpnose Big-eye Bream	1	1	-	-
Serranidae	Groupers, Sea Basses	-	-	5	1
Lutjanidae	Snappers	2	1	-	-
Scombridae	Tuna, Mackerel	-	-	1	1
Elasmobranchii	Shark/ray	1	1	-	-
Acanthuridae	Surgeonfish	-	-	1	1
Muraenidae	Moray Eel	2	1	-	-
Total		**17**	**9**	**12**	**6**

Scaridae, which typically inhabit the inner reef zone, was the most abundant fish family in the assemblage, accounting for 30% of the total MNI. This was followed by the Labridae family, including the Humpnose Big-eye Bream, which are mostly benthic feeders found in both inner and outer reef zones. They represented 20% of the total MNI. Only single individuals were identified for the remaining fish families. This included Carangidae and Scombridae which usually inhabit outer reef zones and are caught by trolling or angling. The presence of a moray eel suggests trapping and spearfishing are likely to have been practised as well.

Reptiles, Mammals, and Birds

A wide range of reptiles and mammals were identified from the assemblage (Table 9.9). Mammal bone formed the second highest proportion of bone after fish (NISP=68), and of the six species identified, bat and rat were the most abundant. Bats, probably of the Pteropus genus commonly known as Flying Foxes which inhabit nearby caves in Wagina, accounted for 27.3% of the total MNI of the mammals. Rats formed a similar proportion.

Table 9.9 NISP, MNE and MNI values of reptile, mammal and bird identified in WAG-4 excavation.

Taxon		**Layer 9**			**Layer 10**		
		NISP	*MNE*	*MNI*	*NISP*	*MNE*	*MNI*
Pig	*Sus scrofa*	9	3	2	-	-	-
Dog	*Canis familiaris*	1	1	1	-	-	-
Bat	Pteropus ?sp	16	5	2	7	3	1
Possum	*Phalanger orientalis*	14	4	1	1	1	1
Rat	*Rattus exulans*	9	3	1	-	-	-
	Solomys ?sp	9	3	1	2	2	1
Turtle	Cheloniidae	1	-	-	3	2	1
Snake	Boidae	1	1	1	-	-	-
Bird	-	8	-	-	10	1	1
Total		**68**	**20**	**9**	**23**	**9**	**5**

Remains of the small-sized *Rattus exulans* were identified, as well as noticeably larger and more robust rat bones. Comparison of these larger remains, which included a complete incisor and a maxilla fragment, to cranial photographs of the *Solomys ponceleti* pictured in Flannery (1995: Plate 7) suggest they belonged to that species or a similarly endangered, large tree-dwelling species of the *Solomys* genus.

At least two pigs were identified based on the presence of two left calcaneum. These differed in size and robustness suggesting one was probably a juvenile and the other nearer to adult-age. A single dog bone was recovered in the assemblage. The bone, a proximal fragment of a left humerus, was small in size suggesting the dog was a juvenile. Remains of at least one or possibly two possums were identified, and some of these exhibited burning and cut marks. The reptile remains included at least one turtle, which was probably a juvenile, and a small snake, likely to be of the Boidae or ‘Boa’ family.

Numerous hollow bird bone shafts were identified as well as part of a beak, specifically an upper mandible, although this was not able to be identified to a species.

9.3.5 Subsistence Change in Manning Strait: Summary

Comparing the faunal results from the Arnavons midden assemblage and the Wagina cave deposit exhibited several similarities and differences between the subsistence practices of the inhabitants of these sites. The remainder of this section examines these and is concluded with a discussion of evidence of change over time in subsistence strategies from the late Lapita period to the last millennium signified by these faunal assemblages.

An important similarity in the subsistence practices of the inhabitants of these sites was the favoured harvesting of Trochus and meko (*Terebralia palustris*). Due to their widespread abundance in Manning Strait, these species are likely to have been reliable and frequented sources of food throughout prehistory. Today, they are commonly harvested by village communities in southeast Choiseul and northwest Isabel, although Trochus is predominantly harvested to be sold to local exporters. Another similarity between the assemblages was evidence of a similarly wide range in reef and benthic fish that were exploited. Parrotfish was the most abundant species identified for both sites which may suggest inshore netting was a particularly favoured or effective technique in this part of the Western Solomons during prehistory (Table 9.10).

Table 9.10 Fish families identified in Manning Strait assemblages sorted to fishing zone and matched to a likely fishing technique (adapted from Walter and Green 2011: Table 4.6).

Fishing Zone	Family	Common Name	Technique
Reef face	Scaridae	Parrotfish	Netting
	Acanthuridae	Surgeonfish	Netting
	Serranidae	Groupers, Sea Bass	Angling, netting
Outer reef zone, pelagic	Carangidae	Mackerel, Kingfish	Trolling, angling
	Scombridae	Tuna, Mackerel	Trolling, angling
Outer reef zone, benthic	Lethrinidae	Emperors	Angling
	Labridae	Wrasses	Angling
	Lutjanidae	Snappers	Angling
	Kyphosidae	Sea Chubs	Angling
	Serranidae	Groupers, Sea Bass	Angling

A noticeable absence for the Arnavons assemblage were remains of fish belonging to the Scombridae family. Today, reef systems surrounding the Arnavons support large populations of tuna, namely Bonito (*Katsuwonus pelamis*), which are commonly caught by trolling. It is possible deep-sea tuna schools were not targeted by the prehistoric inhabitants, although their absence may also be explained by taphonomic processes. The fragility of tuna bone has previously been argued to explain the absence of Scombridae remains in excavations carried out elsewhere in the Solomons (Walter and Green 2011: 23).

Noticeable differences between the Arnavons and Wagina midden assemblages was a higher proportion of marine resources detected in the former, and a more diverse selection of mangrove and terrestrial fauna identified in the latter. Despite an abundance of meko and other mangrove species in mangrove swamps in the interior of Sikopo, the faunal assemble from the site exhibited evidence of the active targeting of large marine shellfish, namely conches, cone shells, turbo shells and cowrie shells. Whereas mangrove and freshwater species, such as keu which is a popular shellfish in the region today, were more prevalent in the Wagina assemblage. In terms of meat consumption, fish and turtle represented a high proportion in the Arnavons assemblage while fish was relatively balanced with terrestrial fauna at Fly Cave. This was demonstrated even when comparing the lowest MNI of fish calculated for one grid square of the 3 m^2 excavation carried out on Sikopo (MNI=38) to the entire excavation of Fly Cave (MNI=15).

Overall, the contrast between the predominantly marine-centred subsistence base of the groups who inhabited the Arnavon Islands between approximately 850-500 calBP and the wide spectrum hunting and foraging subsistence base of the people who occupied Fly Cave around 2200 calBP is most likely a reflection of important ecological differences between the sites. Specifically, Wagina is substantially larger than Sikopo and is more favourable for the inhabitation of large mammals such as wild pig, dog and possum. Whereas, Sikopo, due to its rich reef systems is more conducive to supporting a diverse marine biota and birdlife. Differences in the quantity of the midden deposits, considering the smaller sample size of the Fly Cave excavation, provide some insight into the nature of inhabitation of the sites. The Sikopo midden deposit appears to have accumulated over two phases of semi-permanent occupation by small hamlet-sized populations. Whereas the faunal remains recovered in the lowest cultural layers of Fly Cave and the current radiocarbon dating results suggest an initial short-lived period of occupation by a smaller population (1-2 families).

9.4 Conclusion

This chapter has presented findings from descriptive analyses undertaken on tools and ornaments manufactured from shell and coral recovered during field research in Manning Strait as well as findings from a comparative faunal analysis. The shell and coral artefacts, which proved to be a ubiquitous material class in Manning Strait as has previously been noted in other archaeological surveys in the Western Solomons (Walter and Sheppard 2017: 161), were classified and described according to tool and ornament types. Emphasis was placed on grouping the artefacts according to their function and using traditional knowledge and names from Choiseul (Piko 1976; Craven 1976). Results of the faunal analysis were centred upon examining and comparing subsistence patterns of prehistoric populations who inhabited Manning Strait. Two assemblages were examined from excavations carried out at late prehistoric midden and ceramic deposit on Sikopo (SIK-1) and a cave site on Wagina dated to between 2300-2150 calBP. The rest of this section will be a brief discussion about how these findings contribute to our understanding about the emergence of specialised production of shell valuables during late prehistory in the Western Solomons as well as long-term changes seen in subsistence practices in the region.

Traditional shell-working on Choiseul and shell money varieties made there in the past have rarely featured prominently in archaeological studies of shell ornaments in the Western Solomons. Therefore, the description and classification of shell ornaments and tools recovered in Manning Strait using traditional Avaso and Varisi names and knowledge represents an important contribution to this body of literature. Examination of the shell ornaments recovered in Manning Strait also highlighted the underlying stylistic and technological similarities that have commonly been observed between shell money manufactured in the Western Solomons (Thomas 2003, 2009). Specifically, the recovery of similarly styled shell valuables, namely bakiha, sarumbangara and combs, in southeast Choiseul which date to within the last five centuries reinforce the intensification of shell-working as a communally shared practice in the Western Solomons. Other prominent aspects entangling this community of practice were head-hunting and ceremonial shrine construction. Findings from this investigation demonstrate support for Thomas's (2009: 141) argument that these shared practices developed as a regional phenomenon rather than as something that began in a single centre and was emulated by others. This is demonstrated by regional varieties and independent innovations in the technological process of shell-working such as the hourglass pecking technique used to make kesa at Nuatambu and the exploitation of quartz as an abrasive powder on Laena Island.

Prehistoric subsistence patterns, and particularly long term modification of rainforests, have been a key focus for some researchers in the Western Solomons (e.g. Bayliss-Smith *et al*. 2003). To date, however, there have been no stratified midden deposits and faunal assemblages from the Western Solomons which have been described in as much detail as has been done in this study. Most of the literature on subsistence activities in the Western Solomons has involved ethnobotanical and ethnoarchaeological field research carried out in the New Georgia group. These studies have focused on the historical ecology of 'pristine' rainforests (Bayliss-Smith *et al.* 2003; Hviding 2015), taro cultivation and irrigation (Bayliss-Smith & Hviding 2014; Bayliss-Smith *et al*. 2019; Hviding & Bayliss-Smith 2000), shell-fishing practices and the formation of shell middens (Flores 2009), and the transitioning and modernisation of traditional diets (Furusawa 2005; Pitman 2016). Similarly, in northwest Isabel, Carter (2014) has examined the harvesting of keu (Polymesoda) shells in Kia, and in Choiseul, others have documented traditional plant use and knowledge (Jansen & Sirikolo 2010) and Canarium harvesting (McClatchey *et al*. 2006). The results presented in this chapter, therefore, provide valuable insight into the types of fauna and environments that were exploited by populations in Manning Strait during the late Lapita period and in late prehistory. In the following chapter, results from the comparative faunal analysis and descriptive analysis of the shell tools and ornaments are integrated into final discussions about key tenants of this thesis, namely the prehistoric settlement of the Western Solomons and the development of networks of interaction in the region.

Chapter 10 Discussion and Conclusions

The overall aim of this study was to contribute towards building a more complete and comprehensive archaeological sequence for Solomon Islands. This was stimulated by and shaped in concordance with previous culture historical investigations that have been carried out in the country (Specht 1969; Green 1976; Roe 1992; Wickler 1995; Sheppard and Walter 2006). The field research undertaken in the Manning Strait region represents the most in-depth archaeological project that has so far been carried out in southeast Choiseul. Additionally, prior to this study, there was no existing radiocarbon dating record for Choiseul and the Arnavon Islands, and only two small-scale excavations had been documented for these areas (Miller 1979).

In the first four chapters of this thesis, a background was given of archaeological study of Solomon Islands and of the environment and peoples inhabiting this part of the Western Solomons. The theoretical framework guiding this study, which draws principally on culture history and concepts central to island archaeology such as seascapes and cultural landscapes, was also explained. In the proceeding five chapters, the surveyed and excavated sites and material culture recovered from them were analysed and described in detail. The purpose of this chapter is to synthesise the new findings presented in this study with previous archaeological research carried out in the Western Solomons in order to address the research aims and questions presented in Chapter 1. They are as follows:

1) Develop a cultural sequence for Manning Strait and assess how it fits into current sequences and models of prehistoric colonisation of the Western Solomons.

    1a - When and from where was Manning Strait first settled?

    1b - What archaeological or cultural traits characterise the earliest settlers of the region?

    1c - How do these characteristics change over time from initial settlement in the late Lapita period leading into the historic period?

2) Investigate the nature, extent and development over time of prehistoric trade and exchange networks in Manning Strait.

2a – What inferences can be made from the movement of exchange items regarding the mobility of prehistoric communities in Manning Strait, and what evidence is there of change over time?

2b – How did the production and distribution of pottery, stone tools and shell valuables influence the development of exchange networks and cultural interaction in Manning Strait?

2c - Does the archaeological evidence of the transformation of trade and exchange patterns in the Western Solomons support a historical trend of progressive contraction and regionalisation seen in wider Island Melanesia (Allen 1984)?

3) Assess the role Manning Strait played in hindering or fostering interaction during prehistory and examine how this may have influenced cultural change in the region.

3a – Was the sea channel inhibiting or facilitating interaction between communities in Isabel and Choiseul, and how did this change over time?

3b - Is there evidence in the archaeological record of Manning Strait to support a trend seen in the last millennium in New Georgia of increasing cultural diversification and the formation of regional identities (Thomas 2009)?

3c – How does the historical development of settlement and socio-economic interaction in Manning Strait compare to other archaeological studies of straits in the Pacific?

The remainder of the chapter is divided into six sections, of which, the first four address the research aims and questions. The first section is an examination of the modelling of the prehistoric settlement of Manning Strait, and the second is an exploration of the nature, extent and development of trade and exchange networks in the region. In the third section, a revised cultural sequence is presented for the Western Solomons that draws upon the data generated as part of this study and builds upon the existing archaeological literature. The fourth section is a discussion about the dynamic role Manning Strait played in influencing processes of culture change in this part of the Western Solomons. The chapter is then concluded with an outline of directions for future research in the region and a few final comments.

10.1 Modelling the Prehistoric Settlement of Manning Strait

As was highlighted in Chapter 1, despite over five decades of archaeological research in the Western Solomons, speculation is still raised amongst archaeologists surrounding when and who first colonised this area of Solomon Islands (see comments by Thomas, Bedford and Kirch in Sheppard 2011). Three theories appear to be the most widely believed. One, the first settlers were sparse populations of Non-Austronesian (NAN) speakers who arrived prior to the arrival of Austronesian-speaking Lapita or descendant populations. Two, Lapita migratory groups did not bypass the main Solomon Islands and, although securely dated sites have not yet been found, these groups are likely to have settled the Western Solomons at around the same time as the Northern and Eastern Solomons (ca. 3000 BP). Three, the Western Solomons was not settled until around 2700 BP following a delayed north-to-south advance of stilt-village populations who used incised and applied relief decorated pottery. The remainder of this section will focus on the first and third theories. The question whether the main Solomon Islands was bypassed or 'leap-frogged' by Lapita migratory groups will be touched on although it is not a key focus of this investigation. Before the first and third theories are discussed, it is important to briefly summarise what is currently known regarding the nature and timing of the prehistoric settlement of Isabel, Choiseul and the Arnavon Islands.

On Isabel, the earliest evidence of human settlement recorded so far is Kusira, an intertidal ceramic site located on Barora Faa Island which has been dated by Carter to approximately 2000 calBP (Radclyffe and Carter in prep.). Petrographic analysis of pottery recovered at the site demonstrated their manufacture in Choiseul and this was also exhibited by the geochemical analysis carried out as part of this study on pottery found at the nearby intertidal site of Papatura. Close stylistic similarities between pottery from Kusira and Papatura with Miho and Gharanga/Kopo styled late Lapita intertidal assemblages reported in Roviana Lagoon may also suggest interaction or shared ancestry with stilt-village populations inhabiting the New Georgia group at this time. Therefore, some of the first inhabitants of Isabel may have originated from Choiseul or from further west, and were importing ceramics from potting communities in Choiseul.

Choiseul is likely to have been occupied earlier than Isabel and probably around the same time as the New Georgia group by late Lapita Austronesian-speaking, ceramic populations. Evidence of the movement of incised and fingernail impressed pottery from Choiseul to northwest Isabel during the late to immediate post Lapita period supports this theory. Plus, the limited radiocarbon dating now available for the southern end of the province is also supportive. Fly Cave, an aceramic cave deposit located inland on Wagina, is likely to have been inhabited slightly earlier than northwest Isabel. Specifically, between 2300-2150 calBP. The lack of artefacts recovered in the cave deposit make it very difficult to assess the possible origins of the inhabitants of Fly Cave. Overall, despite an increasing body of archaeological data available for Choiseul, it remains to be the most under-surveyed and least well-understood part of the Western Solomons.

The Arnavon Islands appear to have been first inhabited in late prehistory, and most likely by small groups visiting from Choiseul who transported pottery with them. The excavation on Sikopo revealed two separate phases of prehistoric occupation: the first dating to between 825-700 calBP and the second between 625-500 calBP. Although the pottery associated with these phases was likely to have been manufactured in Choiseul, several sherds found on the surface of a large shrine on Sikopo were also demonstrated to be mineralogically distinctive to Roviana Lagoon. This reinforced historical evidence and stories documented from oral tradition that Roviana head-hunting parties frequented the Arnavon Islands at least as early as the nineteenth century to hunt turtle and were likely to have also constructed and made offerings to coral mound shrines found on the island.

10.1.1 Pre-Lapita Presence

The strongest evidence currently available of non-Austronesian (NAN) speaking populations inhabiting the Western Solomons prior to the arrival of pottery-using, Austronesian-speaking communities is linguistics. Pawley (2009) has argued that differences in conservatism between NW Solomonic and SE Solomonic languages developed as a result of contact between Austronesian and NAN populations. He found for Choiseul, Isabel and New Georgia that a "very high rate of replacement in the most stable part of the lexicon indicates extensive borrowing from non-Austronesian sources" (Pawley 2009: 531). From this, he inferred "that in each of these regions the speakers of incoming NW Solomonic languages encountered *substantial* populations of non-Austronesian languages and that sustained bilingualism… led to many non-Austronesian loanwords entering the basic vocabulary of the NW Solomonic languages" (*Ibid*) (my own italicising). An immediate issue with the presence of *substantial* NAN populations inhabiting the Western Solomons at around the time Austronesian speakers began arriving is the lack of archaeological evidence we currently have to support this.

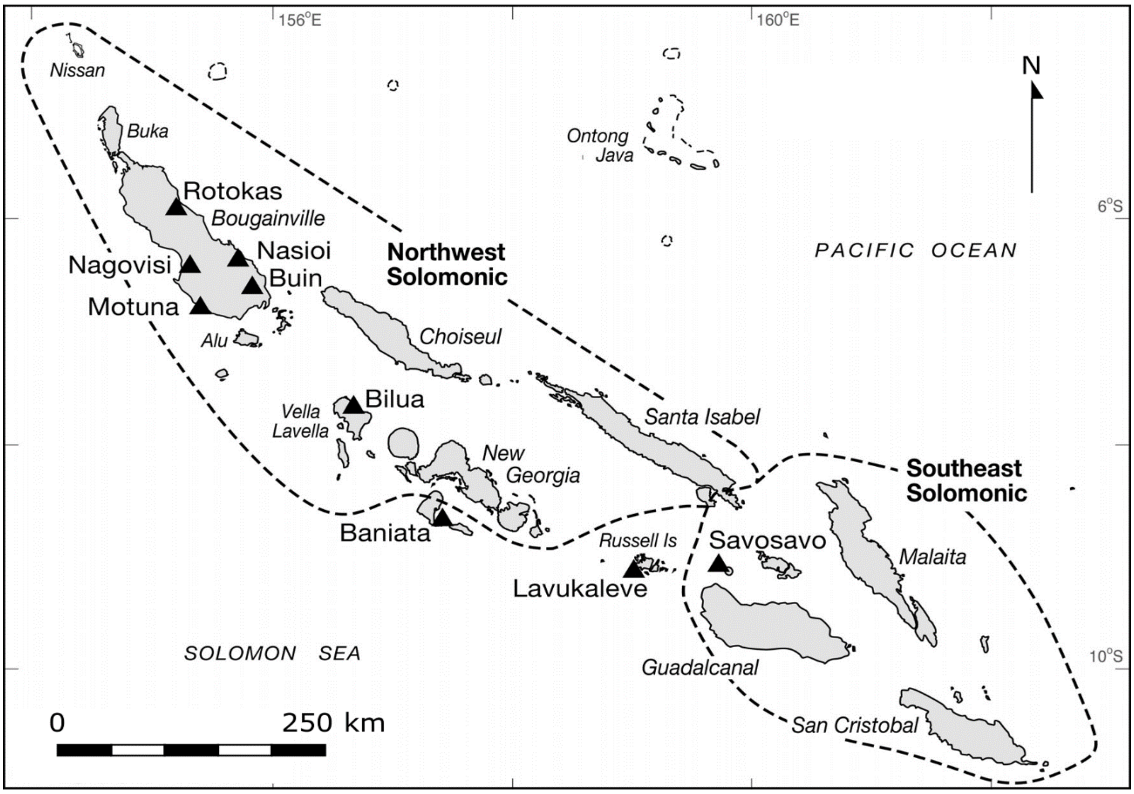


Figure 10.1 Distribution of NAN languages in Solomon Islands (image adapted from Pawley 2009: Fig. 1).

Other linguistic evidence in favour of interaction having occurred between NAN and Austronesian speakers in the main Solomons chain is the modern distribution of NAN languages spoken in Bougainville, the New Georgia group, Russell Islands and Savo located north of Guadalcanal (Figure 10.1) (Dunn & Ross 2007; Ross 2001; Pawley 2009). Eight of the 12 or so NAN languages spoken in these islands are found in Bougainville and, as one proceeds east within the Solomons, the density of these languages decreases. This fall-off of NAN languages may indicate the original distribution and density of populations speaking these languages prior to the arrival of Austronesian populations. For example, it is possible larger NAN populations were living on Bougainville and for a longer duration than in the Western and Central Solomons. Dunn *et al.* (2005) have hypothesised a major split in NAN languages in this part of Melanesia is likely to have occurred around 10,000 BP. However, as other archaeologists have highlighted (Walter and Sheppard 2017: 18), we cannot be certain at this stage of the distribution and density of NAN populations in the main Solomons.

To complicate matters further, NAN languages of the Solomons differ considerably amongst themselves which has made it very difficult for linguists to even relate them to one another (Ross 2001).

To date, no robust archaeological evidence has been uncovered in the Western Solomons of human inhabitation predating Lapita. Additionally, in the nearby Central Solomons, only three aceramic sites have been recorded which date older than 2000 calBP. These include Vatuluma Posovi in Guadalcanal (ca. 4000-6000 BP) (Roe 1993), Mwanihuki, an open coastal site, in northern Makira (ca. 3000 calBP) (Blake *et al.* 2015), and Apunirereha, a chert flaking floor and open inland site, in southeast Malaita (ca. 2100 calBP) (Moser 2018). The discovery made as part of this study of Fly Cave (WAG-4), a 2 m-deep aceramic cave deposit located on Wagina which was dated to 2300-2150 calBP, enables some discussion to be had on the discourse of a former NAN substrate existing in the Western Solomons. The age and nature of the site, being aceramic and located within walking-distance from the coast, makes it comparable to Apunirereha. A unique attribute of Fly Cave, however, is clear evidence of introduced domesticates, specifically pig and dog. The absence of pottery at the site may be a product of sampling or the nature of its occupation (e.g. camp site). However, future excavations that are in planning will test this more comprehensively.

Comparing Fly Cave with early aceramic sites in the Central Solomons highlights the rarity of early aceramic sites despite an underlyingly strong linguistic presence of NAN populations in the western half of the Solomons archipelago. Furthermore, these sites draw attention to our lack of understanding about the nature of interaction between resident NAN populations and the presumably far more sizeable Austronesian populations who gradually settled the Northern and Western Solomons in the late Lapita period. For instance, were some NAN groups more reclusive than others in intermixing with the arrivals? Under this scenario, it is possible that the inhabitants of Fly Cave occasionally interacted with potting Austronesian communities but retained the predominantly mobile hunting and foraging lifestyle of their NAN ancestors. Alternatively, was the process of integration between NAN and Austronesian populations in the Western Solomons harmonious and occurred rapidly due to resident NAN groups sharing similar cultural and socio-economic practices with the arrivals, except it seems for animal husbandry and pottery-making? This scenario is supported by the presence of a characteristically late Lapita site, Irigila, on Vella Lavella where Austronesian languages appear to have never been spoken (Sheppard *et al*. 2010).

In addition to provoking further examination of the nature of interaction between NAN and Austronesian populations in the Western Solomons, this discussion also highlights underlying issues concerning the creation of a definitive social divide between NAN and Austronesian peoples (see Terrell *et al*. 2001). For example, it is not proposed here that comparing Fly Cave to early aceramic sites in the Central Solomons can assist in characterising or ascertaining what languages were spoken by the inhabitants of these sites, i.e. explain whether the inhabitants were NAN or Austronesian. Rather, I argue that Fly Cave and other early aceramic sites are particularly valuable to providing a more insightful understanding about the complex processes in which prehistoric populations interacted with one another in the Western Solomons and how they may have shaped linguistic and cultural changes over the millennia.

10.1.2 Late Lapita Austronesian Expansion

Currently, the most feasible hypothesis, I believe, that explains the Austronesian settlement of the Western Solomons, and which is supported by findings made in this study, is Sheppard and Walter's modelling of Austronesian-speaking and pottery using populations entering the region during the late Lapita period (ca. 2700-2600 calBP). They originally proposed this model in their 2006 article, *A Revised Model of Solomon Islands Culture History*, in which they listed as the third point in a five-point summary:

> *"The northern and western Solomons as far as New Georgia were settled by Austronesian-speaking, food producing, ceramic making populations moving from the west over a NAN [non-Austronesian] substrate in the Late Lapita period" (Sheppard and Walter 2006: 48).*

The authors have based their estimation of settlement of the Western Solomons, which occurred "around 2600 calBP" (Walter and Sheppard 2017: 60), on the limited radiocarbon record available for intertidal ceramic sites in the New Georgia group (Felgate 2003) as well palynological data generated in Roviana Lagoon (Grimes 2003). Grimes (2003: 231) originally argued that episodes of burning and erosion evident between 3200 and 2750 calBP were indicative of a human presence at this time. Although Walter and Sheppard (2017: 60) have contended that these early signals are difficult to distinguish from natural events, and an anthropologically-modified landscape is only strongly represented by the vegetation and sediment data from around 2700 calBP. Since 2006, the authors have made a few revisions to this model (Sheppard 2011; Sheppard *et al.* 2015; Walter and Sheppard 2017) (Figure 10.2).

However, it has remained largely unchanged and they have continued to highlight a steady growth of supportive data from more recent linguistic, genetic and archaeological research (Sheppard 2019a). This includes recent ancient DNA analyses published in the last several years (Lipson *et al.* 2018; Posth *et al.* 2018; Skoglund *et al.* 2016), from which Sheppard has argued that "a late Lapita push into the established settlements of Remote Oceania may be indicated, perhaps at the same time as the movement into the Western Solomons and along the south Papuan coast" (see comments by Sheppard in Bedford *et al.* 2018: 216).

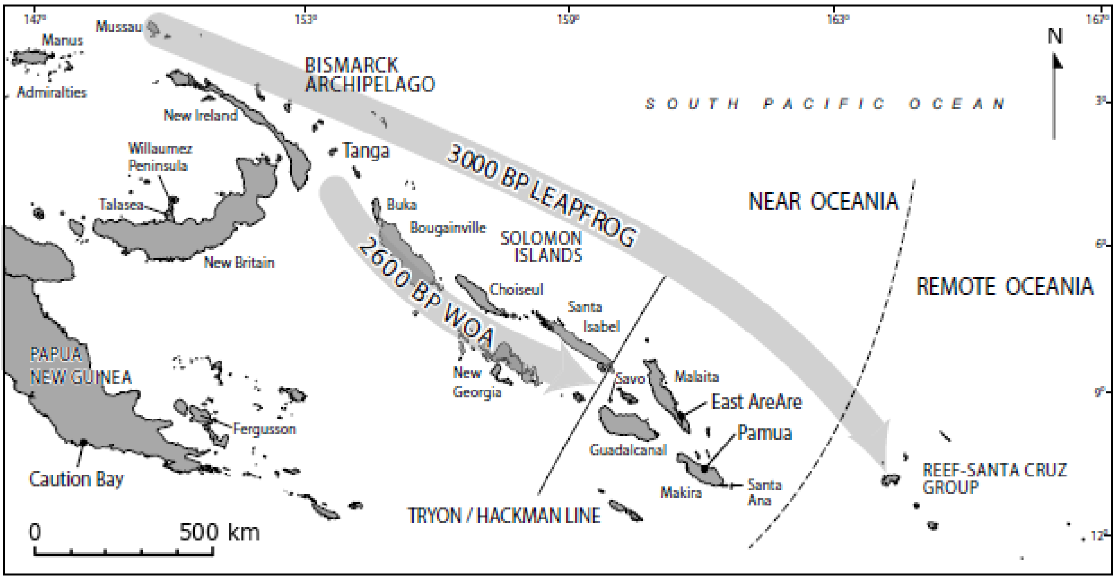


Figure 10.2 Map of northern Island Melanesia showing Lapita leap-frog settlement of Eastern Solomons and gradual late Lapita settlement of the main Solomons archipelago (image from Sheppard 2019a). WOA = wave of advance.

It is also now recognised from surveying carried out on Isabel by Carter, Gibbs, Roe and others (Carter *et al.* 2012), and which is reinforced by the discovery of a late Lapita intertidal ceramic site on Papatura (PAP-1) made as part of this study, that the distribution of intertidal ceramic sites extends to northwest Isabel. Sheppard (2019a: 139) has also raised the possibility that thick plainware pottery recovered by Roe in the Bughotu District of southeast Isabel may "be of a similar age to the intertidal ceramics". Therefore, it is clear that the distribution of late Lapita intertidal ceramic sites encompasses a significant portion of the Western Solomons including almost the entire New Georgia group, perhaps both ends of Isabel and is very likely to include Choiseul. Although for Choiseul, Nuatambu remains the only intertidal ceramic deposit that has been documented in the province which may approach the age of the earliest estimated arrival of Austronesian settlers to the region. Pottery has been widely recorded at the northern end of the province (Miller 1979; Craven 1976, 2019) and on the Shortland Islands (Irwin 1972), although the ceramic traditions appear to date only to within the last millennium.

Reflecting on the contribution this study makes to testing or building upon Walter and Sheppard's model, an important point should be highlighted. That is the enduring rarity in the Western Solomons, or in the case of this study, an absence of dentate stamped pottery found in the Manning Strait region. Decorative techniques observed for the late Lapita assemblage found on Papatura consisted predominantly of fingernail impression, crenulated or wavy rims and linear incision. While for the post-Lapita assemblages dating to within the last millennium, linear incision and single-tool impression were dominant. There were also differences in vessel forms between the late and post-Lapita assemblages with the former consisting primarily of outcurving carinated (Form IV) jars while inward/direct (Form VI) jars were more dominant for the latter. The absence of a dentate stamped component in the intertidal assemblages documented in the Manning Strait region may suggest this area was colonised later than the New Georgia group. Radiocarbon dating of the earliest site known thus far in Isabel, Kusira, supports this. The staggered nature of colonisation of the Western Solomons supports Walter and Sheppard's modelling of a gradual north-south wave of advance. Although it is equally possible, I believe, that not all of the earliest pottery-using and Austronesian-speaking communities reaching the Western Solomons possessed dentate stamped pottery or practised this particular technique.

In order to better understand the nature of the prehistoric colonisation of the Western Solomons and the course of cultural change in the region, it is essential to assess how prehistoric communities interacted with one another. Specifically, what characterised the extent, nature and scale of networks of interaction that existed in Manning Strait and how they developed over time. Examining the production and movement of material goods in trade and exchange networks has proven to be a particularly effective approach by this study.

10.2 Development of Networks of Interaction in Manning Strait

Exchange systems documented ethnographically in Solomon Islands, as for many parts of Melanesia, have been described to have predominantly operated at a regional or meso-scale and to have involved both reciprocal barter exchanges and sophisticated levels of stratification and power distribution. Additionally, these networks have conventionally centred upon the trading of food and specialised production of a craft at a village or crafts-person level (e.g. Ambrose 1978). Prominent examples include red-feather money trade in the Eastern Solomons (Davenport 1962), Malaitan shell money exchange and ceremonies in the Central Solomons (Connell 1977; Cooper 1971; Ross 1978) and Tridacna shell ring exchange in the Western Solomons (Miller 1978; Aswani and Sheppard 2003). Archaeological studies that have examined exchange patterns in Solomon Islands during the late to immediate post-Lapita period through the movement of material culture have generally demonstrated evidence of much wider spheres of socio-economic interaction that involved the transportation of goods across vast distances over the sea. This is exemplified by the movement of obsidian from Talasea and Fergusson Island to the Reef/Santa Cruz Islands (Sheppard 1993) and from the Admiralties to Tikopia (Reepmeyer 2009; Spriggs *et al*. 2010), as well as the transferal of pottery across the Solomon Sea from Muyuw Island to intertidal villages in the New Georgia group (Tochilin *et al*. 2012; Sheppard *et al*. 2015).

This section draws on the results presented earlier in the thesis to build upon this examination of the nature, scale and long-term transformation of networks of interaction in Solomon Islands but with special attention given to the production and movement of pottery in the Western Solomons. It is divided into two segments. The first presents an overview of our current knowledge about ceramic production and transfer patterns in the Western Solomons. Within this segment, a description is given of the Choiseul ceramic tradition which is divided chronologically into four major wares. The second segment is a discussion about how exchange systems have changed over time in the Western Solomons. Specifically, I evaluate evidence, mainly from the transfer of pottery, for a breakdown of region-wide exchange networks into smaller circuits of increasing specialization and complexity modelled by Allen (1984).

10.2.1 Pottery Production and Distribution

The Western Solomons is a valuable case study for examining the emergence and development of pottery production and exchange as the craft has a complex history that stretches over much of the last three millennia. Following its introduction by Austronesian migratory groups in the late Lapita period (ca. 2700 calBP), there is evidence of a possible hiatus in pottery production and exchange between 2000 and 1000 calBP. Then in the last millennium, including in the Shortland Islands, multiple ceramic traditions developed with incised and impressed decoration being commonplace. Gradually by about 200 calBP, pottery-making phased out across the Western Solomons, except in northwest Choiseul where plainware was actively manufactured up until the 1970s. The chronological emergence and dissolution of these ceramic traditions in the Western Solomons is illustrated in Figure 10.3. Listed in the figure are major ceramic wares or styles that have been documented in the region and in the Shortland Islands. Later in the section, ceramic transfer patterns described in the Western Solomons are illustrated in Figure 10.4. The remaining paragraphs examine each region, in turn, giving brief summaries about the development of pottery-making and exchange networks.

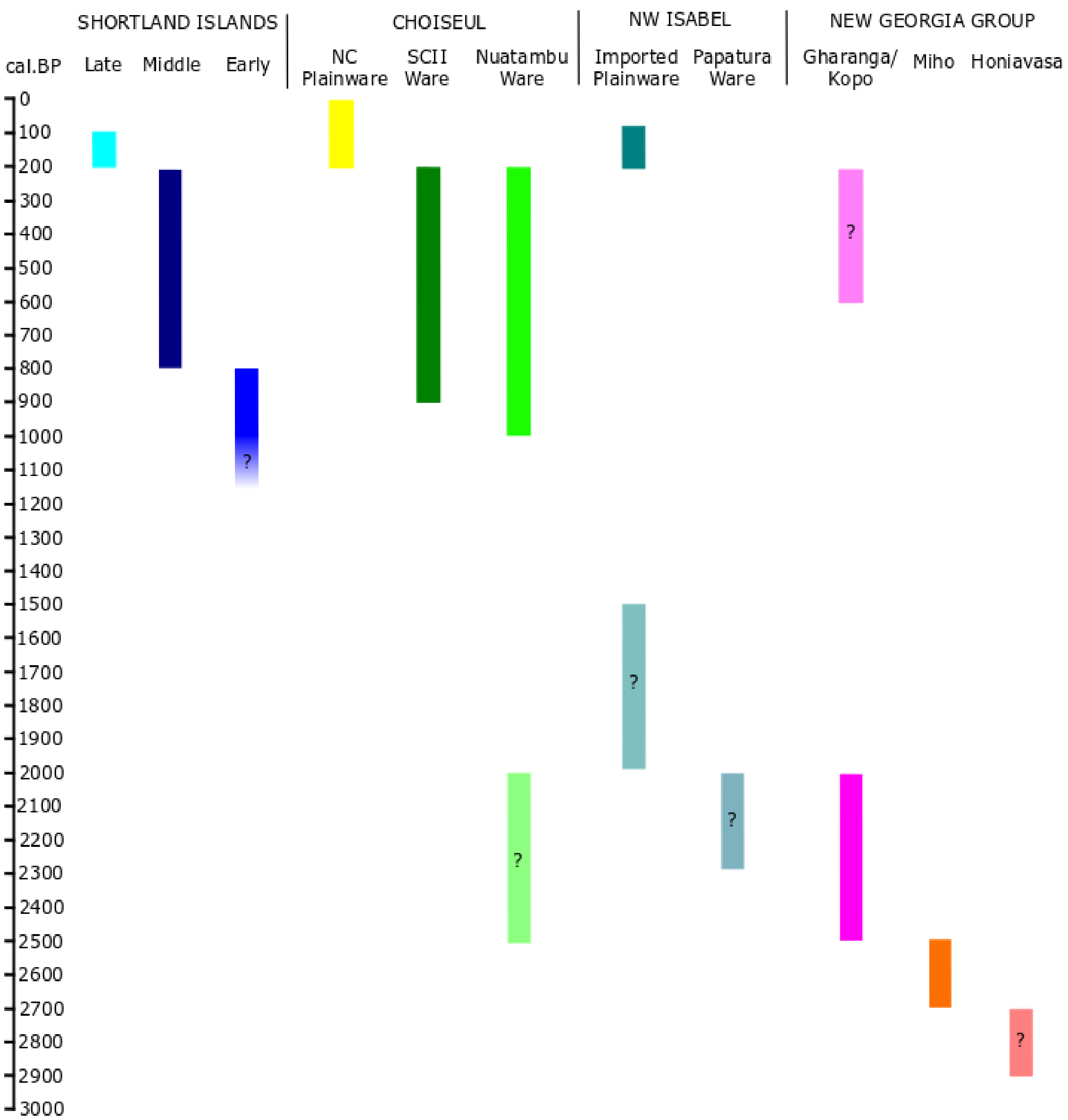


Figure 10.3 Timeline of ceramic wares in the Western Solomons and Shortland Islands. Based on radiocarbon dating and seriation carried out by the author, Carter et al. (2012), Irwin (1972) and Felgate (2003, 2007). Question marks and lightly shaded bars indicate uncertainty in the exact dating.

In the New Georgia group, there is evidence of local manufacture of pottery from the outset of Austronesian colonisation in the late Lapita period. Felgate (2003, 2007: 135) has argued that the earliest tradition, Honiavasa, may extend to as early as 2800 to 3000 BP. But more secure radiocarbon dating of stratified deposits, I argue, is required to refine the Roviana ceramic sequence. Compositional analyses carried out on both late and post-Lapita assemblages from the New Georgia group have demonstrated evidence of wide internal networks of exchange within the archipelago (Felgate and Dickinson 2001; Nagaoka 2011: 178-183; Buhring 2011, *et al.* 2014; Findlater *et al.* 2009). Furthermore, they have exhibited evidence of the importation into the area of pottery from Choiseul during late prehistory and into the historic period.

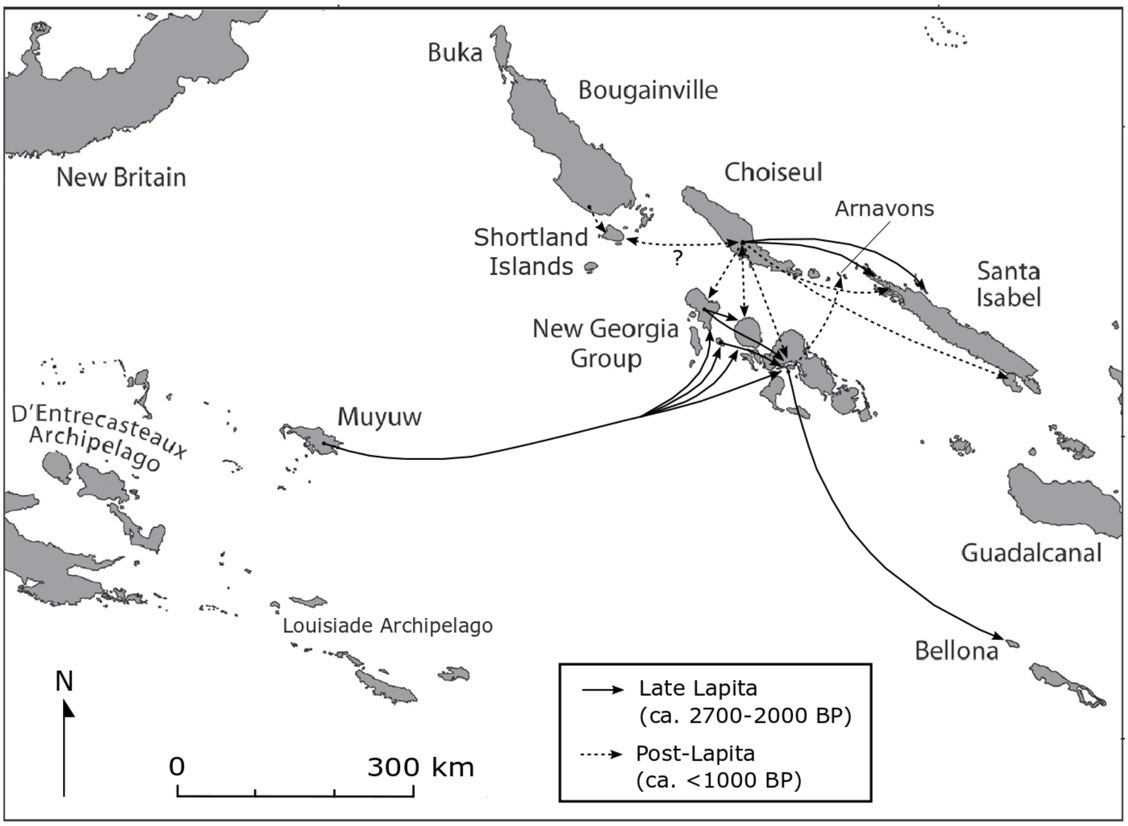


Figure 10.4 Late Lapita (ca. 2700-2000 BP) and post-Lapita (ca. <1000 BP) ceramic transfer patterns documented in the Western and Northern Solomons.

In addition to local inter-island trade, there are also indications of interaction occurring across the Solomon Sea during the late Lapita period (Dickinson and Felgate 2001; Tochilin *et al.* 2012; Sheppard *et al*. 2015). This includes the importation of pottery from Muyuw Island to the New Georgia group, as well as pottery found on Bellona being sourced petrographically to the New Georgia group (Dickinson 2006: 108-109). Findings from this study indicate that potting communities in Choiseul do not appear to have been engaged in the Solomon Sea interaction sphere. The only inclination of this was the resemblance of a sherd found on Nuatambu, which was characterised stylistically to be of late Lapita origin (Richards 2011), to Combed Ware documented in the Massim (Irwin *et al*. 2019: Fig. 5). Despite there being a growing body of evidence of interaction over the Solomon Sea, I concur with the following argument made by Sheppard *et al.* (2015: 77) that "the amount of interaction across the Solomon Sea was not sufficient to alter in any visible way the established dominant north-south cultural patterns… associated with the Lapita cultural tradition south along both the coast of Papua and down the Solomon Islands chain".

Unlike in Choiseul, pottery-making appears to have been abandoned across much of the New Georgia group earlier in time, specifically from around 2000 calBP. Plainware found inland at late prehistoric sites in the New Georgia group have commonly been characterised to Choiseul (Buhring *et al.* 2014: 13). Findings from this study suggest, however, that the practice was not completely abandoned in the New Georgia group during this time. This was demonstrated by the characterisation of a thick plain sherd (SIK 531) found on a coral mound shrine on Sikopo to New Georgia and the possible characterisation of an outcurving notched rim sherd (LAE 4009) found on Laena Island to Kolombangara. Both these sites date to within the last five to six centuries and suggest that pottery-making was practised in pockets on the New Georgia archipelago that began probably sometime after 1000 BP and endured until approximately the last few centuries.

Choiseul appears to have developed as a regional hub of pottery production and trade in the Western Solomons, certainly by the last millennium but with evidence of trading to northwest Isabel occurring during the late Lapita period. In Chapter 7, it was demonstrated that the vast majority of late prehistoric pottery recovered during field surveys in Manning Strait was manufactured in Choiseul. Furthermore, previous ceramic studies carried out in the Western Solomons have demonstrated that pottery, usually plain unrestricted pots with notched rims, made in Choiseul was the most commonly distributed pottery in the region (Dickinson and Shutler 2000; Dickson and Felgate 2001; Dickinson 2006; Findlater *et al.* 2009; Carter *et al.* 2012; Buhring 2011; Buhring *et al.* 2014). The Choiseul ceramic tradition is discussed in further detail in section 10.2.1.

In northwest Isabel, evidence of local pottery production has not yet been detected. The earliest assemblages from the area, which derive from two intertidal sites Kusira and Papatura, closely resemble the Roviana styles, Miho and Gharanga/Kopo. Interestingly, these late Lapita intertidal assemblages and post-Lapita pottery recovered by Carter (*et al.* 2012) in the interior of mainland northwest Isabel all appear to have been imported from Choiseul (Radclyffe and Carter in prep.). Other intertidal sites are likely to be present in northwest Isabel which may exhibit evidence of local pottery production as has been demonstrated to be the norm for intertidal communities who settled the New Georgia group. Until then, however, the evidence suggests a continuous but not completely undisrupted stream of pottery made in Choiseul being traded across Manning Strait to northwest Isabel over much of the last two millennia.

Reviewing the limited evidence available of pottery-making in the Shortland Islands (Irwin 1972, 1974; Dickinson 1973), the tradition appears to have begun significantly later in time than on Choiseul and the New Georgia group. Its emergence appears to have coincided with, or at least is very likely to have contributed towards the formation of a regional network of interaction that involved Shortland Islands, southern Bougainville and, to a lesser extent, northwest Choiseul (Irwin and Terrell 1972). Irwin and Terrell argue that, in the historic period, the frequency of inter-island communication in Bougainville Strait appears to have increased. In turn, this culminated in the development of a lively trade between the Shortlands and Buin late in the nineteenth century and the establishment of permanent villages of Shortland (Alu) people on the southern Bougainville coast (Oliver 1949: 13, 1955: 8).

Stylistic evidence presented as part of this study in Chapter 6, referring specifically to close decorative and morphological similarities observed between the Nuatambu assemblage and the Shortlands Middle Period incised ceramic ware, supports Irwin and Terrell's notion of the inclusion of Choiseul in the Bougainville interaction system. It is likely, however, that more frequent interaction was confined to the northern half of Choiseul and that the southern half of the province maintained closer cultural and socio-economic ties with the New Georgia group and northwest Isabel. Previous petrographic analysis of pottery from the Shortland Islands has demonstrated very similar compositions to pottery made in Choiseul with plagioclase being dominant, followed by hornblende and augite coupled with an absence of hypersthene or biotite and very little to no quartz (Dickinson 1973). Overall, greater effort made in narrowing down the movement of pottery within Manning Strait and the wider Western Solomons would require further geochemical analysis and more comprehensive sampling of riverine and volcanic beach sands from around the region.

Choiseul Ceramic Tradition

Narrowing down our understanding of the prehistoric development of a ceramic tradition in Choiseul, results from the geochemical analysis carried out in this study demonstrated evidence of at least two zones of pottery production: central Choiseul (Nuatambu) and southeast Choiseul (Kumboro region). With the addition of ethnographic research and the very limited archaeological data available for northwest Choiseul (Itoh and Chikamori 1965; Craven 1976; USP 1979; Miller 1979), this region, specifically the potting communities of Chirovanga, can be added as a third major zone. Pottery-making is very likely to have begun in northwest Choiseul at the same time as the other two zones or may well have occurred earlier in the late Lapita period. Further archaeological investigations are required in Choiseul to gain a more comprehensive assessment of the various wares and styles of pottery made there in the past. Findings made in this study, however, enable a partial reconstruction of this tradition (Figures 10.5 and 10.6).

In the remainder of this segment, four wares of the Choiseul ceramic tradition are described. These wares do not adequately encompass the entire range of the Choiseul ceramic tradition, namely because a large gap persists between the late Lapita ware and post-Lapita incised and impressed wares. Another reason is that more surveying in Choiseul would likely uncover additional minor stylistic variations in the ceramic tradition.

Late Lapita Ware (ca. 2700-2000 BP)

There is currently very limited evidence of late Lapita pottery production on Choiseul. This includes a single thick neck/shoulder sherd decorated with curvilinear incisions configured in tongue motifs which was found on the surface of Nuatambu (NUA-1) and has been described to be of 'Late Lapita origin' (Richards 2011) (Figure 10.5: NUA 1547). It is possible a late Lapita deposit has not yet been detected at the intertidal beach site, however, further excavation is required to determine this.

A more comprehensive record of late Lapita ceramic ware available for the Western Solomons has been documented from intertidal sites investigated in the New Georgia group (Felgate 2003, 2007; Summerhayes and Scales 2005; Walter and Sheppard 2017). The earliest styles, Honiavasa and Poitete, are characterised by rare examples

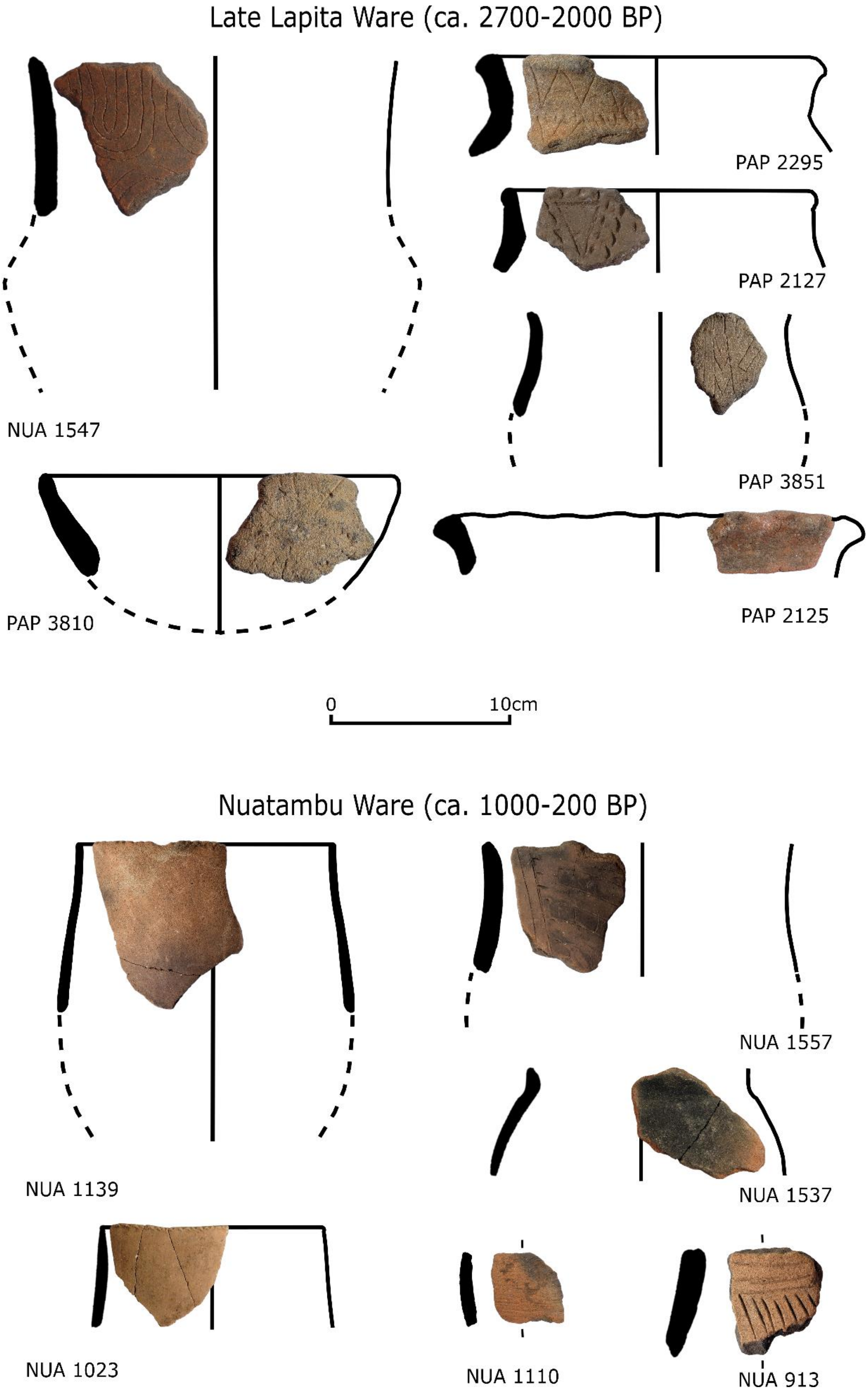


Figure 10.5 Key examples of decoration and vessel forms of Late Lapita Ware and Nuatambu Ware.

of coarsely dentate-stamped sherds, applique strips and knobs, incision and impression, a high number of carinated vessels and several decorated open dishes and bowls. The slightly later Miho and Gharanga/Kopo styles are characterised by bands of impressed fingernail impressions, crenulated or wavy rims, notched rims, a band of punctation below the rim, and far fewer carinated jars.

To the data from Roviana and Kolombangara can be added ceramic assemblages that have more recently been found in northwest Isabel, specifically Kusira (Carter *et al.* 2012) and Papatura. These assemblages exhibited a similar dominance of fingernail impression, crenulated rims, and carinated jars with outcurving rims (Form IV). Plus, the Papatura assemblage demonstrated an almost exclusive use of calcareous beach sands as temper. The only horizontal rim identified in the entire Manning Strait assemblage was found at Papatura. Another result worth noting is that red slip was only identified in the intertidal assemblage from Papatura and in none of the post-Lapita assemblages. Thus, red-slip represents another marker for pottery from this early prehistoric tradition of pottery-making.

Nuatambu Ware (ca. 1000-200 BP)

Nuatambu Ware refers to pottery manufactured during approximately the last millennium at Nuatambu using local volcanic beach sands. Its fabric, composed mainly of large masses of calcic amphiboles, hornblendes and plagioclase, was characteristic of the Mt Maetambe-derived pyroclastic andesitic bedrock present in central Choiseul. Stylistically, it was characterised by the predominance of lip notching, linear incision, single-tool impression and the brushing or wiping of the vessel exterior. The most common decorative configuration, as was observed for the Southeast Choiseul Incised and Impressed (SCII) Ware and has been reported for Middle Period incised ware in the Shortland Islands (Irwin 1972: Plates 35-36), were parallel linear incisions enclosing a series of short linear impressions (e.g. Figure 10.5: NUA 1557; Figure 10.6: WAG 3166). This was typically applied to the vessel shoulder and either with just incision or both incision and impression.

In contrast to the SCII Ware, the most dominant vessel form for the Nuatambu Ware were Form VI jars which possessed inward oriented spout-like mouths, an undefined neck, and narrow, gently shouldered bodies. Form V everted and inverted globular pots were the second most dominant form for this ware and, notably, outcurving Form IV pots were relatively uncommon.

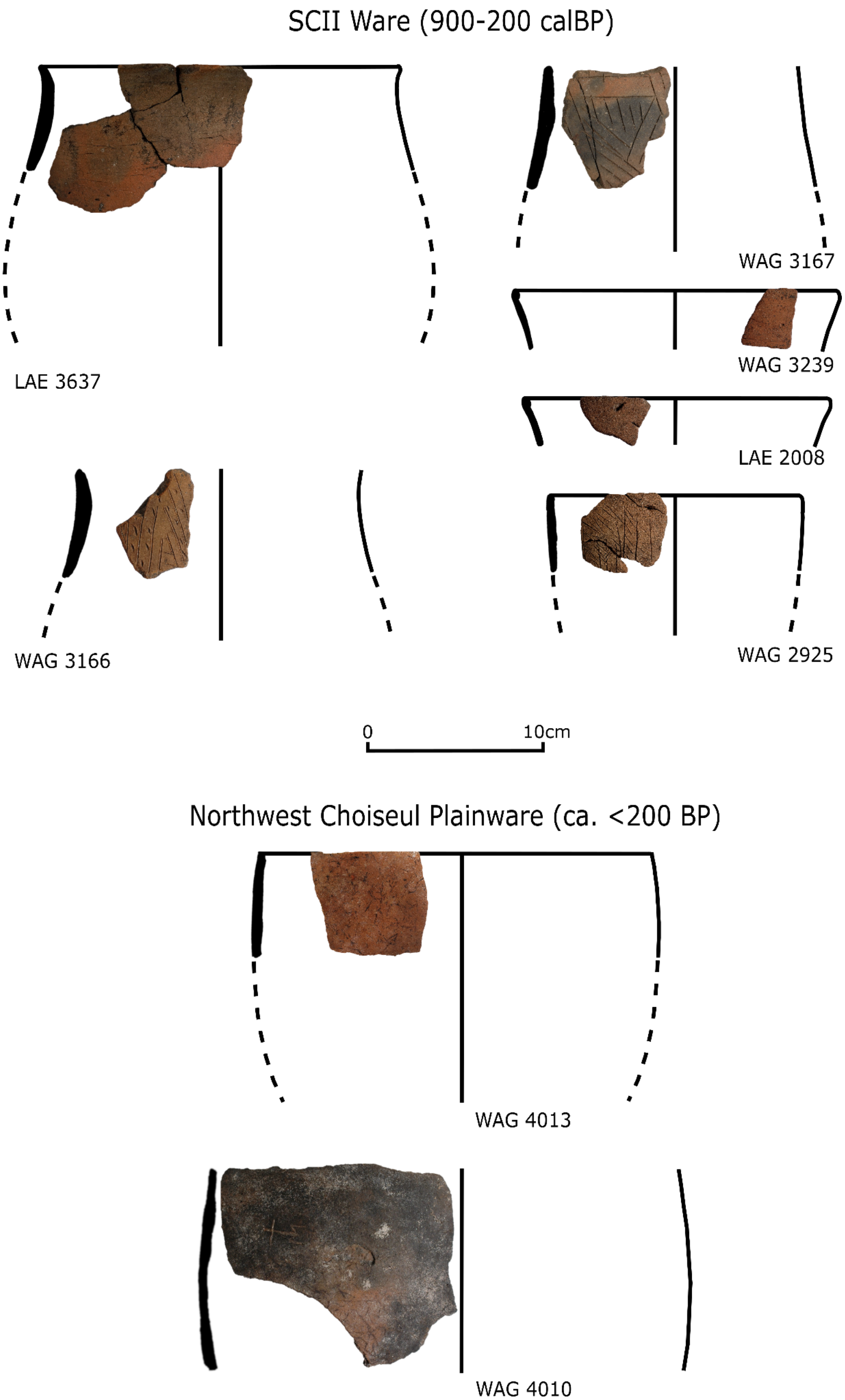


Figure 10.6 Key examples of decoration and vessel forms of Southeast Choiseul Incised and Impressed (SCII) Ware and Northwest Choiseul Plainware.

Southeast Choiseul Incised and Impressed (SCII) Ware (900-200 calBP)

SCII Ware refers to pottery found on Laena Island, Wagina and Sikopo which was made between 900-200 calBP in the Kumboro region of southeast Choiseul. Its fabric is distinguished by containing metamorphic clastic-rich stream sands characteristic of the Choiseul Schists formation. SCII Ware and Nuatambu Ware overlap temporally and share a fundamental stylistic commonality – the dominance of linear incision and single-tool impression. Unlike the Nuatambu Ware, however, SCII Ware was characterised by a predominance of Form IV outcurving pots with more noticeably flared rims. These vessels predominantly appeared gently carinated or globular, although there was greater evidence for this ware compared to the Nuatambu Ware of sharply carinated outcurving vessels that were likely to have been as equally wide as they were tall. Other distinctive traits observed for both the Laena Island and Wagina assemblages included the presence of inner lips on several outcurving rims, created either through the application of thin strips of clay or the pressing of excess clay to the rim (Figure 10.6: WAG 3239, LAE 2008). Additionally, unrestricted bowls and pots from both these sites were typically decorated with thickened outer lips and incised patterns running diagonally to the central vessel axis.

Northwest Choiseul Plainware (ca. <200 BP)

Northwest Choiseul Plainware refers to plain pots made in the last few centuries in northwest Choiseul, most likely in the vicinity of the ethnographic potting centre of Chirovanga. This ware is greatly simplified compared to the previous styles, appearing plain apart from rim notching, very thin (2-5 mm) and bowl-like in form. Examples of this ware, such as the vessel found at a skull shrine site in southern Wagina pictured in Figure 10.6, have been widely documented in the Western Solomons (Carter *et al.* 2012; Walter *et al.* 2004: 148). In northwest Choiseul, they have been historically documented at burial sites, used as interment vessels (Craven 1976, 2019).

10.2.2 Regionalisation and Specialisation: Change Over Time

Changes evident in the production and distribution of pottery from over the last two and a half millennia in the Western Solomons provide valuable insight into the evolution of prehistoric trade and exchange systems in this part of Island Melanesia. To briefly summarise these changes described earlier in section 10.2.1, in the late Lapita period, pottery-making formed an integral aspect of traditional life for stilt-village communities settling the New Georgia group, northwest Isabel and, very likely, Choiseul. These communities were highly mobile and interaction spheres were extensive, stretching even across the Solomon Sea. After 2000 calBP, pottery-making traditions appear far more uniform and generally simpler in the complexity of decoration and vessel forms made. Plus, the craft appears to have been widely abandoned except in Choiseul. From this period, the vast exchange networks exhibit evidence of contracting and in the last millennium, inter-island trade of pottery appears predominantly localised to within the Western Solomons.

The remainder of this section will expand upon and compare these changes observed for the Western Solomons to an evolutionary trend argued in other archaeological studies of Melanesian exchange systems (Allen 1984; Kirch 1991). This trend, evident throughout the last 2000 years, has involved gradual or episodic constrictions in the geographic scale of exchange networks accompanied by subsequent increases in the intensity of exchange within these progressively smaller systems (Kirch 1991: 156). In particular, evidence will be discussed in favour of, and against, Allen's (1984) Melanesian exchange model in order to gain a more refined understanding about the factors that contributed towards the transformation of exchange systems in the Western Solomons.

Towards the tail-end of the Lapita period, exchange systems around the Pacific have commonly been described to have contracted or diminished all together (Kirch 1988, 1990, 1991; Allen 1985; Summerhayes 2003, 2009). In the case of the Western Solomons, however, there is strong evidence that suggests a sphere of interaction over the Solomon Sea developed from the outset of occupation of the region during the late Lapita period (ca. 2700 calBP) that may have lasted over the following 500 years (Sheppard *et al.* 2015: 71). Evidence of this was first suggested by Felgate and Dickinson (2001) following the petrographic identification of an 'anomalous' quartz-calcite fabric amongst some of the Roviana intertidal assemblages that appeared foreign to Solomon Islands' geology. Since their discovery, more recent analysis of a sample of six quartz-calcite tempered sherds, using U-Pb isotopic dating of zircons, has confirmed the temper derived from Muyuw (Woodlark) Island, located directly west of the New Georgia group in the Louisiade Archipelago (Tochilin *et al.* 2012). In a detailed discussion of this 'Solomon Sea interaction sphere', Sheppard *et al.* (2015) highlight that accidental drift voyages recorded historically may have been common in prehistory. Nonetheless, they make clear that the now sizeable number of sherds possessing this anomalous fabric that have been identified in a dozen of the New

Georgia intertidal sites suggest repeated and sustained interaction occurred over an extended length of time in the late Lapita period (see Sheppard *et al*. 2015: Table 1).

At around 2000 BP, interaction across the Solomon Sea appears to have ceased and over time, particularly in the last millennium, trade networks in the Western Solomons generally appear to have reduced in size. Despite the spatial contraction of networks, there is still evidence of trade items that are unobtainable in the main Solomon Islands such as obsidian having occasionally reached the Western Solomons most likely through down-the-line exchange (Radclyffe *et al.* 2019). Found on Sikopo in the Arnavon Islands, the obsidian flake was transported over 900 km from its source in Talasea, West New Britain. The finding indicated that trade goods were still moving over vast distances in late prehistory in this part of the Solomons, albeit more sporadically than what occurred in the late Lapita period. An integral role in this was an increasing number of trade networks that arose in the Northern Solomons in the last millennium, such as the Buka-Nissan-New Ireland sphere (Blackwood 1935; Wickler 1995) and the Bougainville Strait interaction sphere (Irwin 1972; Terrell and Irwin 1972), that are likely to have overlapped with one another.

Terrell (1976) has demonstrated through a nearest-neighbour model (Figure 4.5) that spatial proximity between these island groups and the elongated, linear nature of the Solomons archipelago appear to have greatly shaped the development of these spheres of interaction. Another important factor to consider is the modes of exchange that operated in the late and post-Lapita periods. For example, direct access and home-base reciprocity, referring to exchanges taking place at the home or stilt-village communities, appear to be the most common modes in the late Lapita period. Whereas, in the last millennium and particularly in the last few centuries (e.g. Hogbin 1964; Ross 1978), there is greater evidence of exchange practices becoming more complex, involving both boundary and home reciprocity as well as middleman trading and redistribution.

Other evidence in favour of Allen's (1984) model that has been demonstrated in this investigation of the Western Solomons is an increase observed over time in craft specialisation. This is exemplified by the intensified production and distribution of shell valuables, specifically kesa, sarumbangara, bakiha and other Tridacna shell rings, which developed in the region sometime in the last millennium. On Laena Island, designated shell-grinding stations, specialised drilling stones and the innovative use of ground quartz as an abrasive powder are all testament to this. On Nuatambu, the complex working of kesa and intricate processes involved in their appraisal before being ceremonially gifted or received are also supportive of an increasing specialisation in shell-working (Rooney 1912). In the last two centuries, the production and trading of shell valuables, namely 'money rings' made from Tridacna shell such as poata and hokata, peaked as a result of an increasing European trade presence in the region and a rise in political polities such as the Roviana Chiefdom (Aswani and Sheppard 2003; Walter *et al.* 2004). By amassing mana through conducting successful head-hunting raids and forming political alliances, powerful chiefs prospered by capitalising on highly prized trading ventures, such as the trading of tortoiseshell with Europeans.

In the last millennium, there is also evidence of the development of an increasing degree of standardization in pottery-making. This is demonstrated by the dominance of linear incision and single-tool impression observed across the region between 1000 and 200 BP, and the almost exclusive use of volcanic beach sands and stream sands as fillers. There is evidence of minor variation in vessel shapes between potting communities in Choiseul during this period. Although the overlapping of trade networks which involved these communities suggests this variation most likely came down to differing stylistic expressions, which is an important economic and social factor in intensive, surplus manufacture and trading (Costin 1991; Tite 1992; Santacreu 2014). Overall, these developments indicate that a gradual shift occurred in the organisation of pottery-making perhaps from a smaller scaled or household level of production in the late Lapita period, which was characterised by high heterogeneity in the decoration of intertidal ceramic assemblages and variation in fillers used, to more standardised and uniform production representative of specialised mass production or village-level production in late prehistory (e.g. Tite 1992: 192). Alternatively, the high stylistic and compositional variability of the late Lapita pottery may instead more accurately reflect the behaviour of a colonising potting community familiarising themselves in a new territory (e.g. Leclerc 2019).

Comparing the evidence presented in this investigation of the Western Solomons against Allen's (1984) model, it is clear that the model accurately captures long-term changes and the overall evolutionary trajectory of exchange systems in this part of Melanesia. It is important to acknowledge, however, that this comparison does not imply that interaction networks across the Pacific during the late transitionary phases of the Lapita period were universally contracting. As was demonstrated, in the case of the Western Solomons, there is strong evidence to suggest that spheres of interaction were still very expansive in the late Lapita period and that these spheres only began diminishing from about 2000 calBP. This stands in contrast to the Reef/Santa Cruz Islands where long-distance exchange of obsidian appears to have ceased more abruptly and much earlier in time, occurring around 2700 BP (Walter and Sheppard 2017: 66).

In addition, it is important to acknowledge that despite the spatial contraction of exchange networks that occurred in the post-Lapita period, trade items were still occasionally transported across vast distances that were comparable in geographical extent to Lapita exchanges (Radclyffe *et al.* 2019). Overall, comparing Allen's (1984) model to the Western Solomons has highlighted that it cannot be presumed that the gradual regionalisation of exchange networks occurred simultaneously or for the same reasons across Island Melanesia. The model, I argue, is a valuable foundation upon which to deconstruct and critically assess the historically contingent processes that shaped the development of exchange systems such as has been demonstrated for the Western Solomons.

10.3 A Revised Cultural Sequence for the Western Solomons

From the discussions given above and new findings made in this study related to the prehistoric settlement and development of prehistoric trade and exchange networks in Manning Strait, a revised cultural sequence can be put forward for the Western Solomons (Figure 10.7).

The sequence is divided into six major phases based on cultural characteristics reconstructed from the archaeological record in combination with radiocarbon dating, seriative exercises applied to pottery from the region and historic and ethnographic data. These include a Pre-Lapita Phase (>2700 BP), Late Lapita Phase (2700-2000 BP), 'Aceramic' Phase (2000-1000 BP), Early Hope Phase (1000-500 BP), Late Hope Phase (500-100 BP) and Historic Phase (<100 BP). Each of these phases, except for the pre-Lapita phase which was discussed earlier in the chapter, are described in the remainder of this section.

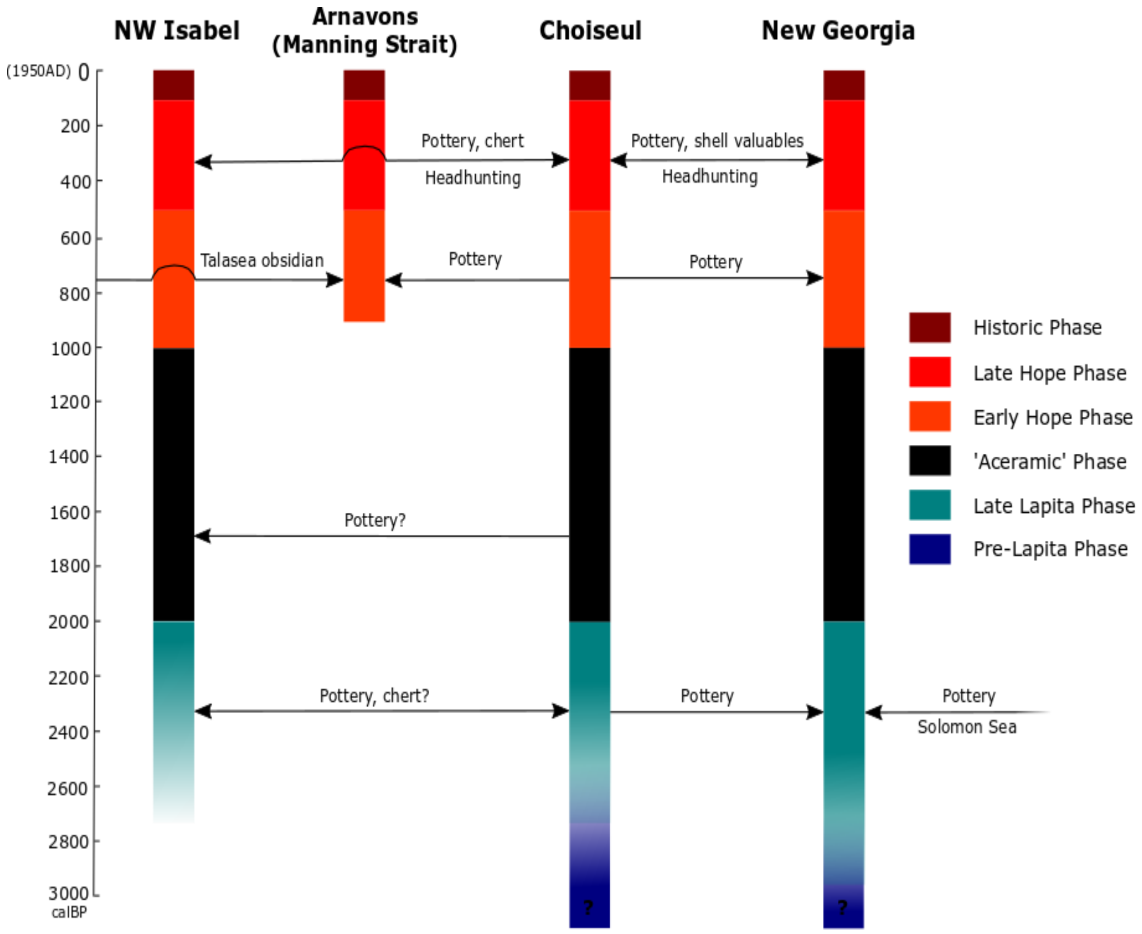


Figure 10.7 Revised cultural sequence for the Western Solomons. Six major phases are illustrated as well as patterns of interaction and the transferal of goods detected between northwest Isabel, Arnavon Islands, Choiseul, the New Georgia group and from further afield across the Solomon Sea and from the Bismarck Archipelago.

10.3.1 Late Lapita Phase (ca. 2700-2000 BP)

Austronesian colonisation of the Manning Strait region occurred in a north to south direction during the late to mid-first millennium BC, supporting mainstream linguistic evidence (Pawley 2009; Ross 1988) and a delayed model of Lapita colonisation proposed for the Western Solomons (Sheppard and Walter 2006, 2009; Walter and Sheppard 2017; Sheppard 2011, 2019a). Archaeologically, late Lapita settlers of the Western Solomons were characterised by intertidal stilt-village settlement, highly mobile, coastal lifestyles and engagement in expansive, open-ocean spheres of interaction including across the Solomon Sea. Pottery-making was widely practised, and the stylistic and compositional heterogeneity observed between late Lapita assemblages in the Western Solomons suggests this may have occurred at a household level of production (Tite 1993: 192).

Stylistically, the pottery from this period is characterised by a wide array of open vessel forms and complex carinated jars and the predominance of incision, applied relief, fingernail impression and crenulated rims. Intertidal assemblages from Roviana and northwest Isabel resemble late Lapita ceramics documented from sites on mainland New Ireland and on Tanga Island. These include Lasigi (Site ELS) (Golson 1991) and Fissoa (Site ENX) (White & Murray-Wallace 1996), which both date to between about 2300-2000 calBP (Garling 2017: Table 2.2), as well as Angkitkita (ETM) on Tanga Island dated to 2350-1900 calBP (Garling 2017: 68). A wide range of terrigenous and calcareous fillers were used in pottery-making during this period which may be linked to expected behaviour of groups colonising a new region (e.g. Leclerc 2019). Horticultural and agricultural subsistence practices are likely to have been more intensively practised during this period than the pre-Lapita phase. Furthermore, this period heralded an unprecedently rich repertoire of material culture including larger and more complex assemblages of flaked and groundstone tools as well as shell tools.

Near the end of this phase, the vast exchange networks appear to diminish. A similar pattern has been documented in the Buka-Sohano ceramic series, where long-distance linkages dwindled and a regionally distinctive tradition began to emerge.

10.3.2 ‘Aceramic’ Phase (ca. 2000-1000 BP)

Between about 2000 to 1000 BP, there is a large gap in the archaeological record of the Western Solomons. In Walter and Sheppard’s (2017: 140) archaeological sequence for Roviana Lagoon, they associate this period – which they title the ‘Aceramic Period’ – namely with the disappearance of ceramics. A generalised movement inland at this time may explain the disappearance of pottery on coastal sites as has previously been suggested by Thomas (2009: 122). Although Walter and Sheppard (2017: 141) insist that it was “highly probable that the prime settlement locations near passages and fresh water (which were the favoured intertidal site locations) [were] continued to be occupied after the ceramic tradition ended”. This was supported, they highlighted, by pollen records from Roviana which indicated near-continuous burning from ca. 2600 calBP to the present (Grimes 2003: 143).

Only one site in the region has been radiocarbon dated to within this time period, Rofe Hill, a small pottery and midden deposit located on the mainland of northwest Isabel (Carter *et al.* 2012: 64). Six plain sherds were recovered from a 1 x 0.5 m test excavation carried out at the site, and the earliest phase of occupation was dated to 1880-1610 calBP (WK24901). Petrographic analysis carried out on them suggested that they were manufactured in Choiseul (Radclyffe and Carter in prep.). Therefore, although pottery-making appears to have been abandoned in the New Georgia group during this period, the practice is likely to have continued in Choiseul. More intensive pottery production did not appear, however, until the last millennium.

10.3.3 Early Hope Phase (ca. 1000-500 BP)

The Early Hope Phase is characterised by the emergence of shrine construction, a gradual transition from inland to coastal settlement, and the production and intensified regional trading of incised and impressed ceramic wares. Currently, the earliest documented form of shrine construction are inland earthen mounds with basalt slabs found at Bao in the interior of New Georgia dated to around 800 calBP (Walter and Sheppard 2017: Fig. 7.17). A similar form of erected coral slab shrines also appears to have developed in southeast Choiseul, specifically on Laena Island, between 650-550 calBP. The development of monumental shrine construction was significant as it signified the growth of a more spiritually entangled conceptualisation and organisation of land and communal space. Equally as important, it facilitated the dwelling or 'housing' of spirits and provided kin a means to continue to interact with ancestors (Thomas 2014: 63).

Pottery-making during this period and in the Late Hope Phase exhibited a transition from the late Lapita period to becoming more standardised. Fillers used in the process were almost exclusively restricted to volcanic beach and stream sands. Although the identification of a single sherd (SIK 410) with a dominantly calcareous fabric in the SIK-1 assemblage indicated that calcareous beach sands were not completely abandoned. Additionally, the application and design of surface decoration of pottery, which was dominated by lip notching, linear incision and single-tool impression, only minorly varied between sites in the Manning Strait region. The most pronounced stylistic variation between wares made during this period were the predominance of Form VI narrow-bodied, spout-like mouthed pots made in Nuatambu and more noticeably flared, Form IV outcurving pots made in southeast Choiseul. The ceramic wares that developed during this time closely resembled Shortland Island Middle Period incised ware.

During this period, the Arnavon Islands were settled by groups proficient in exploiting a marine subsistence base and there appears to have been a gradual intensification of trade linkages across and within the vicinity of Manning Strait. Obsidian imported from Talasea to the Arnavons, most likely through down-the-line exchange, demonstrates that local trade linkages overlapped with those developing in the Northern Solomons.

10.3.4 Late Hope Phase (ca. 500-100 BP)

Major cultural changes visible in the archaeological record of the Western Solomons during this period included the development of head-hunting, coral mound shrine construction and intensified production and distribution of shell valuables. The archaeological landscape grew considerably in density and complexity at this time, most noticeably with a higher concentration of shrines being documented within clustered village settlements (Thomas 2014: 56). This is exemplified by the fortified shrine complex on Nusa Roviana (Walter and Sheppard 2000: Fig. 4), as well as the impressive coral wall and shrine complexes recorded on Laena Island. Shrines proliferated not only in number but also in their associations and functions, for instance, as garden shrines, shell-working shrines, fishing shrines and so on (Nagaoka 1999). Votive offerings, which sometimes included human skulls, food and shell valuables, are more evident on coral mound shrines during this period compared to the Early Hope Phase.

An intensification in the making and exchanging of shell valuables was a crucial development during this period. Variability in manufacturing methods such as the specialised use of abrasive quartz powder called *sauru* on Laena Island, and hour-glass pecking of Tridacna ring preforms to make kesa on Nuatambu (Miller 1979: 83), suggest technological innovations arose independently in parts of the Western Solomons. Although, close stylistic and technological similarities observed between shell valuables in the region, namely shell rings, combs and sarumbangara, also highlight evidence of the gradual entangling of the making, uses and traditional significance placed on these objects. Increasing interaction between communities that resulted from head-hunting raids, enslavement and intensified regional trade, contributed towards the development of a community of practice in the Western Solomons.

While the production and exchange of shell valuables intensified, pottery-making and trading appears to have gradually declined during this phase. This was most likely due to the dislocation of coastal settlements, namely in southeast Choiseul and northwest Isabel, and the disruption of pottery trading across Manning Strait that were brought about by an intensification in Roviana-led head-hunting raids. Near the end of this period, the craft was abandoned across the Western Solomons except for in northwest Choiseul where a plainware tradition continued.

10.3.5 Historic Phase (ca. <100 BP)

The Historic Phase refers to a period of massive cultural change between the mid-nineteenth and twentieth centuries that were influenced by an intensification of contact and trade with Europeans, and the gradual integration of Christianity into traditional lifeways. The impacts these changes had to cultures in the Western Solomons, including the dissolution of head-hunting and widespread destruction of shrines, were described in Chapter 2 and so will not be repeated here. Also worth noting for this period was that from about the 1850s to the 1970s, plainware was actively produced and traded in northwest Choiseul, specifically within the potting region of Chirovanga. Ethnographic research and surveys in northwest Choiseul have demonstrated that plain, open pots of this tradition were commonly used as internment jars. In southeast Choiseul, specifically on Wagina and perhaps on Laena Island, these jars may have also served a similar purpose. Thus, highlighting the retainment of a ceremonial value of pottery in addition to their economic purposes as trade items and food and water containers.

10.4 Manning Strait: A Dynamic Seascape

The following section is centred upon conceptualising Manning Strait as a seascape and examining its role in shaping interaction and processes of cultural change and diversification in the Western Solomons. How the seascape fluctuated and altered over time from serving as an ocean highway in the late Lapita period to becoming a highly contested seascape in the last millennium is discussed. In addition, the prehistoric development of interaction and cultural diversification in Manning Strait will be briefly compared to other straits in the Pacific, specifically Bougainville Strait, Vitiaz Strait and Torres Strait. This is done to highlight important biogeographical and cultural parallels between the straits and the communities that inhabited them.

The major cultural developments and changes that took place over the course of Western Solomons' prehistory accentuate the dynamic role Manning Strait played in shaping and influencing these cultural processes. From initial settlement during the late Lapita period, Manning Strait facilitated the movement of pottery and most likely chert between northwest Isabel and communities in Choiseul. The 40 km-wide channel served as an ocean corridor, providing calmer and more predictable travel than at open sea. Furthermore, reefs surrounding the Arnavon Islands and its turtle rookeries would have provided attractive fishing and turtle-hunting grounds that would have enticed visits to and across the channel. Although the current archaeological evidence suggests the Arnavons were not inhabited until about 825 calBP, it is likely that they were used as stepping-stone islands in the movement of coastal communities within and across Manning Strait in the late Lapita period.

In the last millennium, this more facilitative role Manning Strait played in fostering trade and exchange between communities in Choiseul and northwest Isabel began drastically changing. The abundance of turtle and the rich fishing grounds surrounding the Arnavon Islands gradually incited competition between tribal parties. Additionally, as head-hunting developed and coastal raiding intensified during this period, Manning Strait acted as a pivotal and the shortest gateway to reaching the populated northern shores of northwest Isabel and southeast Choiseul. In the last few centuries, parts of the channel, specifically the more sheltered waters surrounding Wagina, gained a reputation as a battleground between head-hunting parties from Roviana, northwest Isabel and Choiseul (Miller 1979: 61). Roviana chiefs were particularly cunning in taking advantage of an increasing European presence in the region at this time, trading tortoiseshell for guns, iron tomahawks and other foreign goods (Sheppard 2019b). While Roviana head-hunting parties prospered, other villages in northwest Isabel who repeatedly fell victim to raids suffered greatly and were forced to shift inland. Therefore, for these more vulnerable communities, Manning Strait represented a significant danger to their safety and a barrier to ocean travel.

Archaeological evidence gathered thus far from the Arnavons suggests it was primarily utilised as a satellite island group where a rich array of marine resources and food were able to be harvested. This is demonstrated during initial phases of prehistoric occupation of the island group. Over the last few centuries, this persisted although contestation over access to the island group escalated due to an increasing European demand for tortoiseshell (Hamilton *et al.* 2015). There is also evidence of the island group serving as an important part of a spiritscape, as McNiven has described in Torres Strait, centred upon shrine construction and animistic worship. This was demonstrated by a high number of shellfishing and shell-working shrines constructed on Sikopo as well as ethnographic records of charms being linked to Manning Strait that granted safe passage and ceremonial permission to access resources there (Hocart n.d: 20).

Comparing the dynamic role Manning Strait played in influencing long-term socio-economic and cultural interaction between communities in the Western Solomons to other similar studies of Bougainville Strait, Vitiaz Strait and Torres Strait, three key points can be highlighted. The first point, as McNiven argued in a similar manner for Kulkalgal communities in Torres Strait, is that communally shared beliefs in animistic worship and ritualised practices of shrine construction, head-hunting and shell ornament production and exchange were important drivers for the formation and maintenance of social networks in Manning Strait in the last millennium. In addition to fostering socio-economic interaction, the growth of these shared beliefs and, particularly, the practice of head-hunting, were also integral to the partitioning of communities and the formation of clan-based and regional identities.

The second point is that in contrast to the more impoverished Central Islands in Torres Strait and Siassi Islands in Vitiaz Strait where communities were reliant on subsistence trading due to resource and environmental constraints, this does not appear to have significantly influenced inter-island interaction in Manning Strait. Miller reached a similar viewpoint following an examination of shell rings from the New Georgia group stored at SINM. He stated that "positional factors rather than ecological imbalance (as is the case with Langalanga Lagoon) may have played an important role in the exchange of these shell media" (Miller 1978: 292). Apart from the Arnavon Islands where there are no apparent freshwater springs, there are few major biogeographical or environmental limitations to subsistence needs in the Manning Strait region. Elements of 'subsistence trading' are very likely to have occurred in the region during late prehistory, with the strongest evidence in support of this being ethnographic records of trading of garden and marine foods between 'bush' and coastal communities (Hogbin 1964; Scheffler 1965; Oliver 1967; White 1991).

Overall, social and cultural barriers such as increasing warfare and competition for economic and social supremacy between head-hunting parties and tribal chiefs appear to have been far more impactful to influencing inter-communal interaction in Manning Strait. It is during this heightened period of contestation in late prehistory that heralded a proliferation in the production of prestigious and exchangeable shell valuables, such as bakiha, sarumbangara and other shell rings. Juxtaposing this proliferation, however, was a simultaneous decline in pottery-making and their distribution in the Western Solomons which was most likely instigated by widespread dislocation of coastal settlements and disruptions to cross-channel pottery trade networks.

The third point is that the development of exchange networks in Manning Strait during the last millennium closely parallels the evolution of interaction in Bougainville Strait. Specifically, archaeological findings from these regions demonstrate that similar processes of regionalised and intensified trading, craft specialisation and monumental shrine construction began taking shape from around 1000 BP. Ultimately, following the introduction of iron goods and an escalation in trading with Europeans, these developments culminated in the emergence of one of the most powerful chiefdoms in the region's history (Walter and Sheppard 2000). Why these significant cultural changes developed in the Northern Solomons and Western Solomons from around 1000 BP is not well-understood. To answer this question, further archaeological research would need to be carried out in the region, namely on Choiseul and Shortland Islands. In particular, the large gap in the archaeological record of this part of the Solomons between 2000-1000 BP would need to be addressed to better understand the manner in which networks of interaction expanded, contracted and altered from the late Lapita period to the last millennium.

Overall, comparing the prehistory of Manning Strait to studies of Bougainville Strait, Torres Strait and Vitiaz Strait has demonstrated that similarities between socio-economic practices and environmental conditions can be drawn upon to assist in reconstructing processes of long-term cultural change. Simultaneously, these comparisons also reinforce the point that no strait or any cultural landscape for that matter is the same. Each has its own complex and dynamic history. But, crucially, insight can be gained into these histories by taking a holistic approach to exploring cultural and environmental factors that shaped a region's past as well as by drawing widely from archaeology, historic and ethnographic research, linguistics and genetics.

10.5 Future Directions of Archaeological Research

A valuable outcome of this study has been the laying of foundations for future archaeological research to be undertaken in understudied parts of the Western Solomons, specifically Choiseul, Isabel and Manning Strait. Importantly, a comprehensive radiocarbon record for the Manning Strait region and a ceramic sequence for Choiseul have been generated which can be further tested and refined. Listed below are suggestions for future directions of archaeological study. These recommendations are centred upon building a more comprehensive understanding of the nature and timing of the prehistoric settlement of the Western Solomons and the development of networks of interaction in the region.

- Investigate rockshelter and cave sites for evidence of pre-Lapita occupation. This will be valuable to accurately determining how long ago NAN populations settled the main Solomons and will contribute towards expanding our understanding about the nature of interaction between them and late Lapita Austronesian settlers. Suitable areas to investigate include limestone shelves and other karstic environments with natural freshwater springs such as those found in southern Wagina. It would be intriguing to incorporate ancient DNA analysis in this line of research to explore evidence of interaction that took place at this juncture in time.

- Survey intertidal zones for ceramic scatters. Only two intertidal late Lapita sites have been documented in northwest Isabel and only one possible site on Choiseul. If these regions were populated in anywhere near the density of the New Georgia group where over 20 intertidal sites have been recorded, there are very likely more to be found. Worthwhile starting points in Choiseul would be river mouths and streams situated near Choiseul Bay and reef zones north of Chirovanga as well as sheltered inlets located near the village of Ruruvai. Further excavations at Nuatambu would be also valuable as it is under imminent threat of sea-level rise and wave erosion.

- Investigate the 'Aceramic Phase' (ca. 2000-1000 BP) in Western Solomons' prehistory. This period, which is likely to have been an important transitionary phase between the Late Lapita Phase and Early Hope Phase which saw the emergence of shrine construction and an incised and impressed ceramic tradition, represents a large gap in the archaeological record of the region. Palynological evidence from Roviana Lagoon demonstrates that there was continuous, intensive burning during this period which suggests clearance of vegetation for food production (Grimes 2003). Additionally, the little archaeological evidence available for this timeframe suggests there were generalised movements inland and possibly a widespread hiatus in pottery production except for in Choiseul. Addressing this 'ceramic hiccup' in Western Solomons' past would make a significant contribution in refining our understanding about the long-term development of cultural traditions such as head-hunting, shrine construction and shell money production which make this part of Solomon Islands unique.

- Chert appears to have been widely distributed in the Manning Strait region during prehistory as well as in the largely aceramic Central Solomons. Despite the notoriety of geochemically characterising chert (e.g. Luedtke 1979), recent studies that have employed multivariate approaches have demonstrated some success (Brandl *et al*. 2018; Stueber 2019). Specifically, it would be worth testing the use of microfossil identification, petrography and trace element analysis to differentiate between sources of poor-quality chert such as in northern Isabel and high-quality sources such as Ulawa chert. This line of inquiry would generate considerable insight into understanding the nature of prehistoric mobility and regional interaction within Solomon Islands and how this changed over time.

10.6 Concluding Comments

It was argued at the start of the thesis that having a holistic recognition of the nature and various scales under which interaction may have occurred in the past, as well as what ecological or social barriers may have existed, is crucial to reconstructing processes of culture change in Oceania. This has been demonstrated in this study, which has drawn widely from archaeology, ethnographic and historical studies, linguistics and other scientific research, and has made a valuable contribution to our understanding about Solomon Islands' deep past. In particular, it has expanded upon three fundamental aspects of the culture history of the region. These include the prehistoric settlement of the Western Solomons, long-term evolutionary development of trade and exchange networks, and processes by which cultures of Isabel, Choiseul and the New Georgia group gradually changed over the last two and a half millennia and eventually reached their highly diversified state.

Awareness surrounding archaeology and the value and practice of culture heritage management in Solomon Islands is lacking. In my experience working on Choiseul, I found that elders and community members who had received higher levels of education in Honiara or overseas were usually highly critical of the aims of the research at the outset of the project. This criticism, it appeared to me, stemmed from these members wanting the best outcomes for their communities in meeting development issues they were facing. Although once my research team and I explained that an important aspect of the project was to help answer questions they themselves had about their distant past and to assist in preserving their ancestral sites, these community members became highly supportive. On Nuatambu, the community even put forward the prospect of a local museum or exhibit to be constructed to safely store and display pottery, shell valuables and other material culture found at the village. Anthropological and archaeological research can play a profound role in generating this dialogue and taking steps to help better preserve indigenous *kastoms*, histories and the past identities of Solomon Islands. This is particularly important given the rapid rate at which society in Solomon Islands is becoming Westernised.

Archaeological studies in Solomon Islands, such as this one, depend on continued collaboration between chiefs, landowners and communities, museum and government representatives, non-government organisations (NGOs) and research institutions. It is also reliant upon both the physical remains or landmarks and intangible heritage (e.g. *kastom*) that link modern day Solomon Islanders to their ancestral pasts and homelands. As we enter the third decade of the twenty-first century, there is no clear evidence of the slowing of the threat posed to indigenous cultural heritage by logging, mining and other development schemes (e.g. Katovai *et al*. 2015; Katovai 2016). Although some local communities are taking promising steps (Kereseka 2014; SPC 2016; SPREP 2019; Weaver *et al*. 2013). In addition, impacts of climate change such as shoreline recession, tidal surges, and an increasing intensity and frequency of cyclones and depressions are also contributing towards the loss of land and the destruction of archaeological sites (e.g. Albert *et al.* 2016). To better preserve the cultural heritage of Solomon Islands – one of the most highly culturally and linguistically diverse nations in Oceania – greater collaboration is required between the Solomon Islands Government, rural communities and researchers.

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